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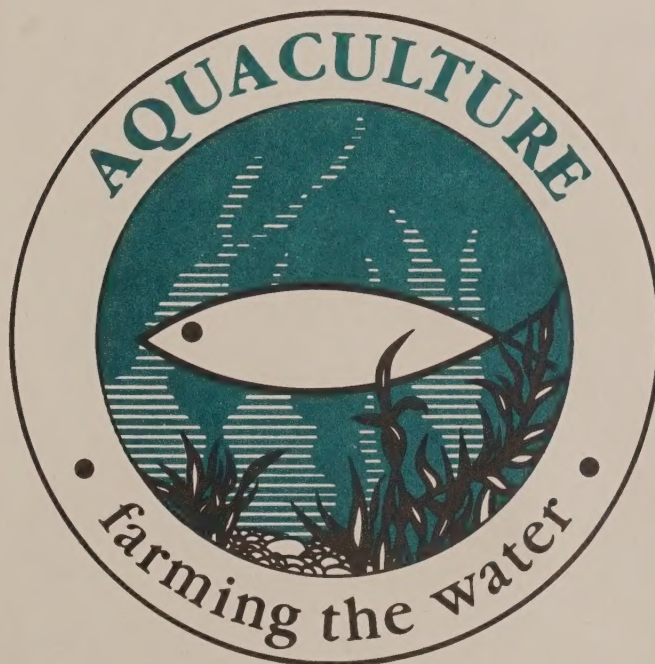
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U.S. AQUATIC ANIMAL HEALTH SERVICES

Current Status Study

June 1993



**United States
Department of
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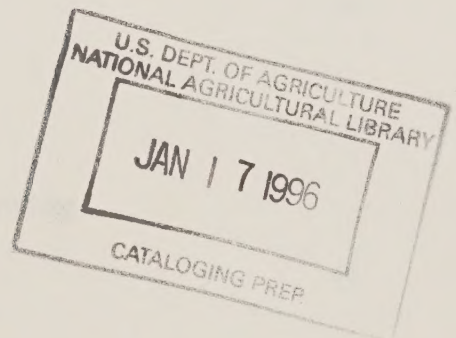


National Agricultural Library

U.S. AQUATIC ANIMAL HEALTH SERVICES

Current Status Study

June 1993



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- Study was conducted on behalf of the Joint Subcommittee on Aquaculture.
- Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.

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Appreciation is also extended to the State Aquaculture Coordinators who researched their respective state's aquatic animal health delivery system and provided information for this study, and to those who reviewed and provided comments on the report.

SUMMARY

This study provides an overview of aquatic animal health management in the field of aquaculture. More specifically, this study identifies aquatic animal health services provided by individual states and territories. It also discusses key issues in the area of aquatic animal health management that need to be addressed in order to facilitate aquaculture development throughout the nation. These issues include but are not limited to: the involvement of veterinary medicine in disease diagnostic services and health certification, and the delineation of responsibility on federal and state agency levels.

The report also provides a unique base of information relative to providers of aquatic animal health services in the responding states, as well as, a list of veterinary schools offering coarse work in aquatic animal medicine.

Further, recommendations are made for a national policy on aquatic animal health management based on the responses of the thirty seven states/territories represented in the study. These recommendations concentrate on assisting individual states/territories by way of case studies and developing programs in the field of aquatic animal health management.

INTRODUCTION

This study was initiated by the Joint Subcommittee on Aquaculture (JSA) to address the key issues facing United States aquaculture development in the field of aquatic animal health management. The purpose of this study is to identify aquatic animal health services provided by individual states and territories within the United States.

Aquaculture is the "propagation and rearing of aquatic species in controlled or selected environments, including, but not limited to, ocean ranching (except private ocean ranching of Pacific salmon for profit in those States where such ranching is prohibited by law)." (2,1) Aquaculture is a form of agriculture; and it is the fastest growing segment of agriculture in the United States. "From 1980 to 1990 fish and shellfish per capita consumption grew five percent annually reaching 15.5 pounds in 1990, which is up from approximately 12.5 pounds in 1980." (3,2) In addition, the Department of Commerce (DOC) has projected that U.S. consumption of seafood could increase thirty percent by the year 2000, which would require an additional one billion pounds of seafood to satisfy demand." (3,2) This increasing demand has spurred tremendous interest in aquaculture and, in many cases, has resulted in new entries into the industry and greater production before necessary components of an industry infrastructure are operational.

With few exceptions, most states have not fully addressed the components of hatcheries, feed manufacturing, processing, marketing and health services as integral parts of their aquaculture industries. States like Mississippi with catfish, Louisiana with crayfish, Idaho with trout, and perhaps Florida with tropical fish have developed these necessary services. However, for the most part aquaculture in the United States is still in its infancy and suffering substantial growing pains. Some federal and state agencies are still trying to come to grips with this additional demand for water resources. Many agencies have not yet determined where commercial production of aquatic plants and animals fits into their regulatory purview. These types of challenges must be overcome through education and understanding in order to allow aquaculture expansion to occur throughout the nation.

Another example of the many challenges facing aquaculture development in the U.S. is in the field of aquatic animal health management. There are critical needs in the areas of disease diagnosis certification and treatment, as well as the demand for new FDA approved therapeutics to help prevent, manage and control diseases in public and private aquaculture facilities. The U.S. Aquatic Animal Health Services: Current Status Study was initiated by the Joint Subcommittee on Aquaculture (JSA) to address such issues.

The JSA is a statutory committee that operates under the aegis of the Federal Coordinating Council on Science, Engineering and Technology, in the Office of the Science Advisor to the President. The mission of the JSA is to serve as a coordinating group to increase the overall effectiveness of Federal programs in aquaculture. The Secretary of Agriculture is designated as the permanent chairman, with the United States Department of Agriculture (USDA) serving as the lead Federal agency for the coordination and dissemination of aquaculture information. At present, twenty three Federal Departments and their agencies are represented in the JSA. The JSA is composed of the following members or their designees:

The Secretary of Agriculture

The Secretary of Commerce

The Secretary of the Interior

The Secretary of Energy

The Secretary of Health and Human Service

The Administrator of the Small Business Administration

The Administrator of the Agency of International Development

The Chairman of the Tennessee Valley Authority

The Director of the National Science Foundation

The Governor of the Farm Credit Administration

The heads of such other Federal agencies as deemed appropriate by the Director of the Office of Science and Technology Policy.

The Secretary of Agriculture, through the JSA and in consultation with the Secretary of Commerce and the Secretary of the Interior, is charged with reporting biennially to Congress on the status of U.S. aquaculture and actions undertaken with regards to the National Aquaculture Development Plan (NADP). (3,1)

The JSA identified five key issues which significantly affect the U.S. aquaculture industry and established a task force to prepare a work plan and strategy for each issue. A steering committee is developing a recommended national strategy on aquatic animal health management. In developing the recommended strategy, information is being solicited from private and public aquaculture sectors. The complete mission statement is included in appendix B. This task force also found it necessary to identify aquatic animal health services that are presently being provided throughout the United States.

As a result, the U.S. Aquatic Animal health Services: Current Status Study was undertaken by the Maryland Department of Agriculture's Aquaculture Office in cooperation with the National Association of State Aquaculture Coordinators (NASAC) to identify the providers of aquatic animal health services. Funding for the study was provided by the United States Department of Agriculture Cooperative States Research Service under agreement No. 91-COOP-2-6400.

METHODS

Through the efforts of the USDA National Agriculture Library's Aquaculture Information Center, a list of Aquaculture Coordinators/Contacts was developed. An updated list was used to initiate contacts for this study and can be found in appendix A. Additional contacts were also made through the National Association of State Departments of Agriculture's (NASDA) executive members. Regional NASAC representatives contacted states to encourage participation and to clarify responses to the study instrument.

This study instrument was developed by State Aquaculture Coordinators (S.A.C.'s) who serve as directors of NASAC, and who also represent each region of the United States delineated by NASDA. The northeastern region is represented by the Delaware S.A.C., the southern region by the Virginia S.A.C., the Midwest region by the Illinois S.A.C., and the western region by the Washington State S.A.C. The Maryland S.A.C. served as coordinator of the study and consulted with the JSA members representing the United States Department of Agriculture/ Animal Plant Health Inspection Service (USDA/APHIS), the United States Department of Interior (USDI)/Fish and Wildlife Service, and The United States Department of Commerce (USCD)/National Marine Fisheries Services.

A copy of the study instrument can be found in appendix A. The study instrument was designed with the intention to learn not only which aquatic animal health services are provided, but also the current status of these services and what is necessary to assist in developing programs in the individual states/territories.

Instructions provided with the study requested that coordinators/contacts provide a copy of the study instrument to state veterinarians, natural resource biologists, university representatives and others involved in aquatic animal health services. In many cases direct responses were received from some sources which were in conflict with responses from other sources in the same state. In all cases responses were summarized or corrected responses were sought.

RESULTS

All data are based only on the information provided by the thirty seven respondents to the study. A list of the study respondents is as follows:

AL - Alabama	NE - Nebraska
AK - Alaska	NJ - New Jersey
CA - California	NY - New York
CO - Colorado	NC - North Carolina
CT - Connecticut	ND - North Dakota
DE - Delaware	OH - Ohio
FL - Florida	PA - Pennsylvania
GA - Georgia	SC - South Carolina
HI - Hawaii	SD - South Dakota
ID - Idaho	TN - Tennessee
IL - Illinois	TX - Texas
IN - Indiana	VA - Virginia
IA - Iowa	WA - Washington
LA - Louisiana	WV - West Virginia
ME - Maine	WI - Wisconsin
MD - Maryland	WY - Wyoming
MI - Michigan	PR - Puerto Rico
MN - Minnesota	GU - Guam
MO - Montana	

Table I and figure 1 (Appendix C) summarize the respondent's information about individual states/territories in the U.S. providing aquatic animal health services for private aquafarms, public aquaculture, and wild stocks, in addition to the type of practitioners that are available to provide these services. Figure 1 further summarizes data presented as a graphic representation of Table I. For example, of the 37 respondents, 28 or 76% reported having aquatic animal health services for private farmers while 30 or 78% reported services for public hatcheries. A very high percentage, 84%, maintained services for wild stocks as in investigation of fish kills. States reporting the availability of private veterinarians and public fish biologists for aquaculture services were nearly equal (30 and 32 respectively). Of 11 states with private veterinarians, nearly half (five) were in southern states including Alabama, Florida, Georgia, West Virginia, and Texas. This partly reflects the relatively large aquaculture industry in the south. In addition, Hawaii and Maine, two states with relatively substantial aquaculture production, reported having private veterinarians available to the industry. Either private veterinarians or public officials (generally fish biologists) are available to provide aquatic animal health services in nearly half (46%) of the states.

Table II (Appendix C) summarizes providers of aquatic animal health services into the individual state/territory and the type of services offered. The study identified 187 laboratories in the United States. Each laboratory is listed in appendix D in numerical sequence with the numbers corresponding to the same numbers found on this table and the tables that follow. Most laboratory listings are accompanied with types of clients and fees charged. For example, virology work is being done in the state of Maryland by Dr. Frank Hetrick and Dr. Ana Baya corresponding to number 97 on the laboratories list (Appendix D) and Table II (Appendix C).

Most states generally have animal health laboratories or veterinary schools laboratories which provide service to traditional livestock and poultry producers. These are also found in Appendix D in numerical sequence with other laboratories within their respective states. Table III (Appendix C) summarizes the data received concerning services provided by these traditional livestock and poultry laboratories for aquafarmers and public hatcheries. Figure 2 provides a graphic representation of the 37 responding states. Fifty percent of the laboratories assist public hatcheries, while 46.2% provide services to private aquafarms. In addition, training and funding were identified as resources of highest priority needed for aquafarmers to gain access to services from traditional livestock and poultry health laboratories.

For examples of fees charged for aquatic animal health services refer to Appendix B for fee schedules provided by the states of Florida and Maryland.

Table IV (Appendix C) presents a numerical listing of veterinary schools which provide courses in aquatic animal health and/or services to private and public aquaculture facilities. The numbers correspond with the listing in Appendix D. Figure 3 provides a graphic representation of the percentage of veterinary schools (not states) that offer courses and services related to aquatic animal health. Nearly 55% of the 37 respondents have schools that offer courses in support of aquaculture. Forty eight and one half percent of the veterinary schools assist aquafarmers while only 39.4% work with public hatcheries.

In addition, Table IVa (Appendix C) is included to provide in-depth information on aquatic animal medicine expertise in colleges of veterinary medicine. This Table was developed by the American Veterinary Medical Association and includes all schools that have courses in aquatic animal health(*).

In Table V (Appendix C) only 10 of 37 states do not use out-of-state laboratories. Eight out-of-state laboratories were identified by more than one state. These include Maryland, Montana, two in Arkansas, Pennsylvania, Colorado, West Virginia and Oregon. Of these eight, six are U.S. Fish and Wildlife Service laboratories. The out-of-state laboratories are also included numerically in Appendix D.

While aquatic animal disease diagnostic services are an integral part of this study, health certification, which is checking aquatic stocks for regulatory and/or marketing purposes, plays a prominent role as well. Table VI and Figure 4 (Appendix C) indicate certification programs related to species entering the state, exiting the state, and being released into public waters. Most states, 64.8%, require aquatic animal health certification for fish entering the state while only 2.7% monitor species leaving the state. Intrastate shipments of aquatic animals is a concern in only 21.6% of the states/territories. For example, Washington State Department of Fisheries monitors all shipments within the state. All live fish eggs that are transported must be health certified even if transit is to the airport for export to a foreign destination. One-third of reporting states, 35.1%, require health certification for release into public waters. This may appear to be a low percentage, but many states do not allow any introductions of interstate stocks and, therefore, certification is not an issue.

By way of example, the West Virginia statute on importation of wildlife (Appendix B) is cited as the typical language of most states restricting interstate shipments without prior disease certification.

State fish and game agencies frequently publish what is known in wildlife circles as "clean" or "dirty" lists of fish species. The latter refers to species not acceptable for introduction into that area. Lists have also been generated for fish pathogens. Table VII (Appendix C) shows that nearly 50% of those states responding to

the study have identified specific pathogens that are prohibited. To further illustrate, lists of prohibited pathogens developed by California and Wyoming are included in Appendix B.

In addition to collecting information about state aquatic animal health services, this study made an effort to gather production data. The data was to be presented for private grow-out facilities, private hatcheries, and public hatcheries. Response to these questions was limited at best and, in many cases, non-existent. Additional information was gathered through reports presented at the annual meeting of the National Association of State Aquaculture Coordinators (NASAC) in May 1992.

Tables VIII and IX (Appendix C) summarize the numbers of private hatcheries and grow-out facilities by species. Twenty nine different species or classes of species were spawned in private hatcheries while fifty six species were grown out in commercial production.

The most commonly grown fish reported were catfish, trout, tilapia, and baitfish. Striped bass and its hybrids are also becoming popular.

To further illustrate the diversity of U.S. aquaculture, a chart presented at the 1992 NASAC annual meeting for Illinois lists 39 aquafarmed products from 95 licensed producers in 1991. This variety might be expected for coastal or marine states like Hawaii, Florida, or Texas, but certainly not areas of the Midwest. A version of the chart is listed as part of Appendix C.

National production figures compiled through the efforts of Mr. David Harvey, USDA/Economic Research Service can be found in Appendix C. These Tables were included to illustrate the increase in aquaculture production in the U.S. over the last decade.

Discussion

The scope of the "Aquatic Animal Health Services: Current Status Study" did not include other aquatics such as plants, either edible or ornamental. Another study may be needed to determine the extent to which aquatic plants are produced, and mechanisms for disease control.

- The study did not specifically ask for names of fish pathologists (non-veterinary) who are active in disease diagnostic and health certification programs. However, many of the laboratories listed in Appendix D are related to veterinary and non-veterinary technicians.

- Certain states have made more progress than others by including aquatic animals with other classes of livestock and poultry. Florida is an example of the progress made in this area.

"In Florida we have encouraged the development of veterinary service to fish farmers. This seems to be working quite well and we have had excellent cooperation and interest from the veterinary community and producers (fish culturists)."

- Wisconsin has successfully brought traditional natural resource's fish pathologists and veterinarians together in support of aquaculture.

"State and federal fish health workers have worked with members of the veterinary school, and there has recently been increased interest on the part of the state to expand collaboration with the veterinary school."

- Although most U.S. jurisdictions are making progress in providing aquatic animal health services, others are

struggling due primarily to the lack of physical and financial resources. When asked what resources would be required to provide aquatic animal health diagnostic services, a respondent answered, "An act of God."

- Concerning health certification, current discussion centers on whether there should be total disclosure of the complete medical history of the fish lot or fish farm, and what information should be included. There are some who believe that all data regarding the fish health history should be included, while others believe that only information specifically requested by the importing country should be provided.

- The "Procedures for Detection and Identification of Certain Fish Pathogens" (The Blue Book), developed by the Fish Health Section of the American Fisheries Society, enumerates sample sizes recommended for detection of viral, parasitic and bacterial diseases providing a 95% confidence level at assumed minimum incidence levels of detection. Of primary concern to private aquaculture is the use of lethal sampling methods for production fish and broodstock. While the levels (generally 10% of the lot) may be necessary to adequately detect specific pathogens, the economic impact on the aquafarmer's operation should also be considered. The need to establish populations of repeat spawners is critical for the future of aquaculture. In some species, such as striped bass, where domesticated stocks are rare, high levels of lethal sampling (10%) are an economic burden and a sizable loss of desirable genetic material results from this established procedure.

- This report is based upon responses from 37 states and territories. One was received too late for inclusion but should be recognized. Rhode Island listed one lab which provides traditional health services to agriculture.

Rhode Island Division of Agriculture
22 Hayes Street
Providence, RI 02908
401-277-2781

- To assist those states/territories which are just beginning to develop mechanisms for aquatic animal health, an "Aquatic Animal Diagnostic Laboratory Investigation form" provided by Illinois is included in Appendix A.

Conclusions and Recommendations

Aquaculture in the United States is developing at a rapid pace in a regulatory atmosphere never before experienced by any segment of production agriculture. While state and federal regulations are generally designed for consumer or natural resource protection, there remains those instances where commercial fishing interests appear to take precedence over protective measures or aquaculture production. In other cases the infrastructure has simply not kept pace with increased aquafarming. Aquatic animal health diagnostic and certification services are one such case in point.

While there are outstanding examples of cooperation between natural resource agency fish pathologists and agriculture agency veterinarians (Florida, Wisconsin, etc.), far too often there exists instances of non-cooperation and turf battles. Two basic points of contention must be fully addressed and resolved at both state and federal levels. First, is the traditional purview of fish and wildlife or natural resource agency fish pathologists over all aquatic species. Until recent years diagnostic procedures were only developed to respond to massive fish kills or disease outbreaks at public hatcheries, neither of which were prompted by private production. With the advent of aquafarming, response to instances of morbidity (and not just mortality) must be enhanced through new and more effective methods of detection, diagnosis, treatment and management. Protocols acceptable for sampling of wild and hatchery stocks for public enhancement may not be suitable and could be economically devastating for the public or private fish farmer. For example, lethal diagnostic methods administered to ten percent or more broodstock can eventually lead to the degradation of genetic potential. Research is needed to provide better non-lethal sampling procedures.

The first issue, veterinary medicine involvement can be addressed through cooperative efforts between fish pathologists, state veterinarians, extension specialists and private veterinarians. Until such time when all veterinary schools include aquatic animal health in their course structure, the burden will fall on public officials to assist aquaculture.

The "Aquatic Animal Health Services Study" was designed to provide a broad overview of the availability of these services at the state level. The study clearly indicates the presence and value of the aquatic animal health laboratories, colleges of veterinary medicine, and schools of fisheries within respective states as well as the need for federal and state wildlife and agriculture agencies to cooperate in this effort.

The second issue to be raised is the delineation of responsibility for protection of the natural resources versus protection of aquafarmed animals. There is no dispute as to the responsibility of Fish and Wildlife Agencies to restrict introductions of non-indigenous pathogens within their jurisdiction. Equally, it is recognized that Departments of Agriculture maintain active animal health programs to guard the well-being of farm and other domestic animals. The question that still remains in many states and at the federal level is how both regulatory bodies can continue to carry out their respective missions without impeding each other. Furthermore, the advent of closed or recirculating aquaculture facilities complicates the issue even more.

It appears that the states which have listed pathogens that are prohibited from being introduced into wild stocks have controlled the movement of aquafarmed species. There remains the question as to whether wild stocks are impacted in the same way that farm-raised fish may be affected. Are restricted pathogens present in wild stocks at low levels and are they significant? The management of public hatcheries and private farms should shift from pathogen detection to disease control and management.

As mechanisms for fish health diagnosis and certification are established, state and federal agencies must be cognizant of the need to avoid additional levels of bureaucracy and regulations which will impede public and private aquaculture. Field data and production experience must be combined with lab data to determine if a real and significant impact actually occurs.

Overall, a national aquatic animal health strategy is needed for the continued development of the aquaculture industry in the United States. The strategy should be developed to provide direction to states so methods of establishing restricted pathogen or species lists will be the same throughout the U.S. The strategy should also recognize aquacultured species as farm animals with responsibility for health of these animals to fall upon fish pathologists and veterinarians and their traditional support agencies. A national strategy should also call for the identification and use of best management practices when culturing aquatic animals as a method of avoiding disease.

Of course, a national aquatic animal health strategy in and of itself, without recognition of the need for resources that are needed for implementation, will not be successful. These resources include dedicated financial assistance for U.S. Fish and Wildlife laboratories, state schools of veterinary medicine, state animal health programs, and training at all levels.

In addition to diagnostic services, a national aquatic animal health strategy needs to establish a consistent procedure for certification of facilities and lot shipments. These procedures should reduce the time it takes for aquafarmers to receive clearance to transport fish and assist in avoiding complications with state and federal laws and regulations.

Further, a national strategy should provide guidance leading to reasonable approvals of therapeutants used in aquaculture. Diagnostic and certification programs are only as useful as the mechanisms available to growers for management and treatment of diseases. Without the latter, the former simply becomes an academic exercise.

REFERENCES

1. U.S. Department of Agriculture. Aquaculture Situation and Outlook Report. Washington, DC: Economic Research Service. September 1988.
2. U.S. Department of Agriculture, U.S. Department of Commerce, U.S. Department of Interior. 1983. National Aquaculture Development Plan. Reported by The Joint Subcommittee on Aquaculture. Washington, DC.
3. Federal Coordinating Council on Science, Engineering, and Technology. 1992. Aquaculture in the United States: Status, Opportunities, and Recommendations. Report by The Joint Subcommittee on Aquaculture. Washington, DC.
4. Purchase, H.G.; Gloyd, Joe; Pitts, John L. Opportunities for Veterinarians in Aquaculture. Journal of American Veterinary Medical Association. 1993;202:734-737.

APPENDIX A

Contents:

- An updated list of State Aquaculture Coordinators/Contacts
- A copy of the study instrument
- A copy of an "Aquatic Animal Diagnostic Laboratory Investigation Form" provided by Southern Illinois University at Carbondale

STATE AQUACULTURE COORDINATORS/CONTACTS

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(Study Instrument)

National Association of State Aquaculture Coordinators

NASAC

P.O. Box 1163

Richmond, Virginia 23209

U.S. Aquatic Animal Health Services: A Current Status Study

State: _____

Contact Person: _____

Address: _____

Telephone #: _____ FAX #: _____

1. Does your state have a program which provides aquatic animal health services? (circle one)

for private aquafarms:

- 1. Yes
- 2. No

for public aquaculture (state, federal hatcheries):

- 1. Yes
- 2. No

for wild stocks (investigation of fish kills):

- 1. Yes
- 2. No

Please provide a chart depicting your program, if available.

2. Are there veterinarians involved in providing aquatic animal health services?

private practitioners

- 1. Yes
- 2. No

public officials

1. Yes
2. No

3. Who, within your state, is involved in providing aquatic animal health diagnostic services? (List each separately. Duplicate the following format as necessary):

Business/Agency: _____

Contact Person: _____

Address: _____

Telephone #: _____ FAX #: _____

Services provided: (circle all that apply)

- | | |
|---|-------------------------------|
| 1. Bacteriology | 8. Toxicology (water testing) |
| 2. Antimicrobial
Sensitivity testing | 9. On-farm assistance |
| 3. Virology | 10. Health Certification |
| 4. Parasitology | 11. Triploid Certification |
| 5. Histopathology | 12. Educational Programs |
| 6. Mycology | 12. Other (specify) _____ |
| 7. Nutritional Diseases | _____ |

Types of clients: (circle all that apply)

1. Private aquafarmers
2. University/college Researchers
3. State Hatcheries
4. Private Aquarium Stores
5. Public Aquariums
6. Other (specify) _____

Are fees charged? (circle one)

1. Yes
2. No

Include a fee schedule, if available.

4. List public and private animal health laboratories used by the state's traditional livestock and poultry industries: (list each separately; duplicate the following format as necessary)

Business/Agency: _____

Contact Person: _____

Address: _____

Telephone #: _____ FAX #: _____

Does the lab provide services to aquafarmers?

to private aquafarmers? (circle one)

1. Yes (if yes, list in question 3)
2. No

to public hatcheries? (circle one)

1. Yes
2. No

If no, what resources would be required to provide aquatic animal health diagnostic services? (circle all that apply)

1. Training
2. Facilities
3. Equipment
4. Funding
5. Additional Staff
6. Other _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____

5. List veterinary school(s) in your state; include universities with departments of veterinary science:
(List each separately; duplicate the following format as necessary)

Institution: _____

Contact Person: _____

Address: _____

Telephone #: _____ FAX #: _____

Are courses offered in aquatic animal health? (circle one)

1. Yes
2. No

Are diagnostic/laboratory services offered?

to aquafarmers? (circle one)

1. Yes (if yes, list in question 3)
2. No

to public hatcheries? (circle one)

1. Yes (if yes, list in question 3)
2. No

Comments: _____

6. Out-of-state aquatic animal health laboratories used by aquafarmers or public hatcheries in the state (list each separately; duplicate the following format as necessary):

Business/Agency: _____

Contact Person: _____

Address: _____

Telephone #: _____ FAX #: _____

Services provided: (circle all that apply)

- | | |
|---|-------------------------------|
| 1. Bacteriology | 8. Toxicology (water testing) |
| 2. Antimicrobial
Sensitivity Testing | 9. On-farm Assistance |
| 3. Virology | 10. Health Certification |
| 4. Parasitology | 11. Triploid Certification |
| 5. Histopathology | 12. Educational Programs |
| 6. Mycology | 12. Other (specify) _____ |
| 7. Nutritional Diseases | 13. _____ |

Types of clients: (circle all that apply)

- | | |
|--------------------------------------|----------------------------|
| 1. Private aquafarmers | 4. Private aquarium stores |
| 2. University/college
researchers | 5. Public aquariums |
| 3. State Hatcheries | 6. Other (specify) _____ |

Are fees charged? (circle one)

1. Yes
2. No

(Include a fee schedule if available).

7. Does your state require health certification for aquatic animals? (circle all that apply)

A. Entering the state

1. Yes
2. No

B. Leaving the state

1. Yes

2. No

C. Shipped within the state

1. Yes

2. No

D. Released into public waters

1. Yes

2. No

If yes is answered to any of the above, describe your state's certification process for aquafarms/hatcheries or shipments of aquatic animals including the agency, individual or laboratory providing the certification.

Are fees charged? (circle one)

1. Yes

2. No

(When available, attach a fee schedule).

8. Summary of aquaculture production for your state:

a. Private Grow-Out Facilities

<u>SPECIES</u>	<u>UNITS</u>	1990		1991	
		<u>Production</u>	<u>#Farms</u>	<u>Production</u>	<u>Facilities</u>
1. Catfish	(lbs)	_____	_____	_____	_____
2. Trout	(lbs)	_____	_____	_____	_____
3. Salmon	(lbs)	_____	_____	_____	_____
4. Crawfish	(lbs)	_____	_____	_____	_____
5. Striped Bass	(lbs)	_____	_____	_____	_____
6. Tilapia	(lbs)	_____	_____	_____	_____
7. Baitfish	(lbs)	_____	_____	_____	_____
8. Cold water ornamentals	(lbs)	_____	_____	_____	_____
9. Tropical ornamentals	(lbs)	_____	_____	_____	_____
10. Sturgeon	(lbs)	_____	_____	_____	_____
11. Oysters	(bu)	_____	_____	_____	_____
12. Clams	(bu)	_____	_____	_____	_____
13. Shrimp	(lbs)	_____	_____	_____	_____
Other (list separately, include units)					
14. _____		_____	_____	_____	_____
15. _____		_____	_____	_____	_____
16. _____		_____	_____	_____	_____
17. _____		_____	_____	_____	_____
18. _____		_____	_____	_____	_____
19. _____		_____	_____	_____	_____
20. _____		_____	_____	_____	_____

b. Private Hatcheries

<u>SPECIES</u>	<u>UNITS</u>	1990		1991	
		<u>Production</u>	<u>#Farms</u>	<u>Production</u>	<u>Facilities</u>
1. Catfish	(lbs)	_____	_____	_____	_____
2. Trout	(lbs)	_____	_____	_____	_____
3. Salmon	(lbs)	_____	_____	_____	_____
4. Crawfish	(lbs)	_____	_____	_____	_____
5. Striped Bass	(lbs)	_____	_____	_____	_____
6. Tilapia	(lbs)	_____	_____	_____	_____
7. Baitfish	(lbs)	_____	_____	_____	_____
8. Cold water ornamentals	(lbs)	_____	_____	_____	_____
9. Tropical ornamentals	(lbs)	_____	_____	_____	_____
10. Sturgeon	(lbs)	_____	_____	_____	_____
11. Oysters	(bu)	_____	_____	_____	_____
12. Clams	(bu)	_____	_____	_____	_____
13. Shrimp	(lbs)	_____	_____	_____	_____
Other (list separately, include units)					
14. _____		_____	_____	_____	_____
15. _____		_____	_____	_____	_____
16. _____		_____	_____	_____	_____
17. _____		_____	_____	_____	_____
18. _____		_____	_____	_____	_____
19. _____		_____	_____	_____	_____
20. _____		_____	_____	_____	_____
*(Specify fingerlings, fry, seed, etc.)					

b. Public Hatcheries

SPECIES	UNITS	1990		1991	
		<u>Production</u>	<u>#Farms</u>	<u>Production</u>	<u>Facilities</u>
1. Catfish	(lbs)	_____	_____	_____	_____
2. Trout	(lbs)	_____	_____	_____	_____
3. Salmon	(lbs)	_____	_____	_____	_____
4. Crawfish	(lbs)	_____	_____	_____	_____
5. Striped Bass	(lbs)	_____	_____	_____	_____
6. Tilapia	(lbs)	_____	_____	_____	_____
7. Baitfish	(lbs)	_____	_____	_____	_____
8. Coldwater(lbs) ornamentals		_____	_____	_____	_____
9. Tropical (lbs) ornamentals		_____	_____	_____	_____
10. Sturgeon	(lbs)	_____	_____	_____	_____
11. Oysters	(bu)	_____	_____	_____	_____
12. Clams	(bu)	_____	_____	_____	_____
13. Shrimp	(lbs)	_____	_____	_____	_____
Other (list separately, include units)					
14. _____		_____	_____	_____	_____
15. _____		_____	_____	_____	_____
16. _____		_____	_____	_____	_____
17. _____		_____	_____	_____	_____
18. _____		_____	_____	_____	_____
19. _____		_____	_____	_____	_____
20. _____		_____	_____	_____	_____

*(Specify fingerlings, fry,
seed, etc.)

9. Does your state have a list of aquatic animal pathogens or species that are prohibited from entering? (circle one)

1. Yes (provide list)

2. No

10. What other types of aquatic animal health services are needed in your state? Who might provide these services?

11. Comments:

(12/91 aquasurv)

COOPERATIVE FISHERIES
RESEARCH LABORATORY

Southern Illinois University at Carbondale

Aquatic Animal Diagnostic Laboratory
Investigation Form

Identification number _____ Date received _____

Name _____ Date examined _____

Address _____ Diagnostician _____

Phone _____

Submitted by _____ Pond/Tank number _____

Fish species _____ Acreage/Gallons _____

Type of sample submitted: Fish Water Feed Other _____

COLLECTION DATA

Sample collected by _____

Fish size (inches): Eggs Fry 1-6 7-12 13-18 >18

Fish weight (pounds): <0.001 <0.06 <0.4 <1.5 >1.5
(5gm) (28gm) (182gm) (680gm)

Sample captured: Alive Dead Unknown Sick Feeding Hook

Cast net Seine Hand Dip net Unknown

Number of fish in sample _____

Sample condition: Alive Dead Iced Frozen Preserved Bad

Remarks _____

POND/TANK DATA

Dissolved oxygen: AM _____ PM _____ Last DO stress date _____

Hardness _____ Alkalinity _____ Temperature _____ TAN _____

Nitrites _____ pH _____ Carbon dioxide _____ Chlorides _____

Hydrogen sulfide _____ Un-ionized ammonia _____

Weather: Not applicable Clear Cloudy Calm Windy Rain

Feeding activity: None Slight Good Remarks _____

Recent treatments: No Yes Type _____ Amount _____

Dates for each _____

Off Flavor: Yes No

Water Color Change: No Change Green to brown Green to Clear

Clear to green Other _____

MORTALITY DATA

DAILY MORTALITY

Total dead to date _____ Date _____ No. lost _____

Total no. in pond/tank _____

Percent loss _____

Ave. daily mort. _____

Estimated value of loss _____

Remarks _____

CLINICAL SIGNS

Behavior:

Gasping
Flashing
Lethargic
Fin twitching
Convulsions
In shallow water
Around inflow
Around drain
Around aeration
Head up - tail down
Head - tail whirling
Long axis whirling
Pect. fins folded forward
Anorexia (not feeding)
Belly - up
Loss of balance
Other _____

Lesion Shape:

Irregular
Regular

Lesion Appearance:

Clean
Dirty
Yellow
Red
White

Lesion Location:

Fins
Head
Cranial Foramen
Eyes
Mouth
Peduncle
Ventral
Dorsal
Lateral

Lesion Size:

1-5mm
5-10mm
1.25cm
1-2.5cm
> 2.5cm

Histology samples taken: YES NO

Physical condition:

Normal
Emaciated
Depigmented
Hyperpigmented
Exophthalmia-popeye
Endophthalmia
Swollen belly
Scoliosis
Lordosis

Fins Eroded:

Dorsal
Pectoral
Pelvic
Anal
Adipose

Hemorrhage Location:

Fins
Head
Mouth
Eyes
Peduncle
Ventral
Dorsal
Lateral
Vent
Cranial Foramen

Hemorrhage Size:

Pectichiae
Eccymoses
Suffusion

Gills:

Normal
Pale
Brown
Cherry red
Necrotic
Gas bubbles
Clubbed
Hamburger gill
Hyperplasia
Cellular edema
Hyperemia

CLINICAL SIGNS (CONT.)

Tissues taken:

Gas Bubbles

Gills
Fins
Skin

Intestine and Stomach

Normal
Hemorrhagic
Flaccid
Gas
Mucus
Feces/Food
Fluid
Intussusception
Body cavity fluid

Kidney, Liver and Spleen

Normal
Pale
Hemorrhagic
Brown
Black
Swollen
Mottled
Soft
Congested

Blood

Normal
Anemic
Brown
Black
Cherry red
Metemoglobin
Hct

Coelom

Normal
Cloudy
Bloody
Clear
Gas
Ascites

Swim Bladder

Normal
Hemorrhagic

PARASITOLOGY

Organism	Location	Intensity
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

BACTERIOLOGY

Isolate Number	_____	_____	_____	_____	_____
Gram Stain	_____	_____	_____	_____	_____
Colony Morphology	_____	_____	_____	_____	_____

Motility	_____	_____	_____	_____	_____
BACTERIOLOGY (CONT.)					
Cytochrome Oxidase	_____	_____	_____	_____	_____
O/F Basal Media	_____	_____	_____	_____	_____
Pseudomonas F agar	_____	_____	_____	_____	_____
TSI (A/K, G) System	_____	_____	_____	_____	_____
Hydrogen Sulfide in TSI	_____	_____	_____	_____	_____
Motility Deep	_____	_____	_____	_____	_____
M-S	_____	_____	_____	_____	_____
Urease	_____	_____	_____	_____	_____
Indole	_____	_____	_____	_____	_____
V-P	_____	_____	_____	_____	_____
Lysine Decarbox	_____	_____	_____	_____	_____
Arabinose	_____	_____	_____	_____	_____
Esculin	_____	_____	_____	_____	_____
Salicin	_____	_____	_____	_____	_____
Nonfermenter	_____	_____	_____	_____	_____
Enteric	_____	_____	_____	_____	_____
Anaerobe	_____	_____	_____	_____	_____

Identification

DIAGNOSIS

POTENTIAL TREATMENT

POTENTIAL

DIAGNOSIS _____

TREATMENT _____

PARASITES

- A ☐ Ichthyoboda
- B ☐ Ich
- C ☐ Chilodon
- D ☐ Trichodina
- E ☐ Trichophrya
- F ☐ Ambiphrya
- G ☐ Epistylis
- H ☐ Henneguya
- I ☐ Monogenea (Gills)
- J ☐ Gyrodactylus
- K ☐ Yellow Grub
- L ☐ White Grub
- M ☐ Black Grub
- N ☐ Lernaea
- O ☐ Other _____
- P ☐ Bodamonas
- Q ☐ Apiosoma

BACTERIA

- A ☐ A. hydrophila
- B ☐ A. sobria
- C ☐ Aeromonas sp.
- D ☐ Plasiomonas shigelloides
- E ☐ E. tards
- F ☐ E. ictaluri
- G ☐ Flexibacter external
- H ☐ Other myxbacteria
- I ☐ Pseudomonas f.
- J ☐ Pseudomonas sp.
- K ☐ Klebsiella
- L ☐ Enterobacter
- M ☐ Proteus
- N ☐ Unknown
- O ☐ Other _____
- P ☐ Flexibacter internal

FUNGI

- A ☐ External
- B ☐ Systemic
- C ☐ Branchiomyces
- D ☐ Other _____

WATER QUALITY

- A ☐ Ammonia
- B ☐ Nitrite
- C ☐ Gas Bubble
- D ☐ DO Depletion
- E ☐ Thermal Shock
- F ☐ pH
- G ☐ Other _____
- H ☐ Suspected DO Depletion

NUTRITIONAL

- A ☐ _____

TOXICITY

- A ☐ Bluegreen algae
- B ☐ Overtreatment _____
- C ☐ Pesticides
- D ☐ Other _____

MISCELLANEOUS

- A ☐ Handling
- B ☐ Genetic
- C ☐ Tumors
- D ☐ Crowding
- E ☐ Moving
- F ☐ Inadequate Sample _____
- G ☐ Unknown
- H ☐ Inspection
- I ☐ Routine Check
- J ☐ Other _____
- K ☐ Hamburger Gill
- L ☐ Anemia
- M ☐ Winter Kill

TREATMENT

- ☐ KMnO4
- ☐ Formalin
- ☐ CuSO4
- ☐ Aeration
- ☐ Flush
- ☐ NaCl
- ☐ CaCl2
- ☐ Masoten
- ☐ Calcium hydroxide
- ☐ Tin Oxide
- ☐ Terramycin
- ☐ Betadine
- ☐ Romet-30
- ☐ Other _____

TREATMENT RATE

- ☐ 0.1 ppm
- ☐ 0.25 ppm
- ☐ 1.0 ppm
- ☐ 2 pmppm - Repeated as Necessary
- ☐ 15 ppm
- ☐ 20 ppm
- ☐ 25 ppm
- ☐ 67 ppm
- ☐ 125 ppm
- ☐ 167 ppm
- ☐ 250 ppm
- ☐ 1,000 ppm
- ☐ 10,000 ppm
- ☐ 83 gms/100lbs. feed
- ☐ 133 gms/100lbs. feed
- ☐ 167 gms/100lbs. feed
- ☐ 250 gms/100lbs. feed
- ☐ 400 gms/100lbs. feed
- ☐ 25 mg/lb
- ☐ 0.01 ppm/1ppm T.A.
- ☐ Other _____

METHOD

- ☐ Pond
- ☐ Bath _____
- ☐ Dip _____
- ☐ Flush
- ☐ Feed _____
- ☐ Inject
- ☐ Other _____

APPENDIX B

Contents:

- The mission statement of the Steering Committee on a National Aquatic Animal Health Strategy
- The Florida cost of services list
- The Maryland cost of services list
- The West Virginia statute on the importation of wildlife
- The lists of prohibited pathogens from the state of California and Wyoming

NATIONAL AQUATIC ANIMAL HEALTH STRATEGY

Mission Statement

April 23, 1992

The Joint Subcommittee on Aquaculture¹ and its Fish Health Management Task Force have appointed a National Aquatic Animal Health Strategy Steering Committee and given it a mission to:

- Prepare a Strategy for a comprehensive National Aquatic Animal Health Program to protect and manage aquatic animal health and improve the long-term productivity and sustainability of both natural and cultured aquatic animal resources in the United States.

During Strategy development a high priority shall be given to basic concepts and principles that provide reasonable assurance for:

- Open participation and adequate representation of wide-ranging public and private aquaculture interests, working with a "blank slate", to design equitable and consistent programs protecting the health of public and private aquatic animal resources of the Nation While ensuring the economic viability of aquaculture industries;

- A broad definition of aquatic animals embracing all kinds of wild or cultured fin-fish (including food-, bait-, and ornamental fish), shellfish, and other freshwater or marine cold-blooded aquatic animals;

- Protection of public and private aquatic animal resources from certain pathogens exotic to the United States and the prevention of the spread of certain endemic pathogens to areas known to be free of such pathogens;

- Regional or species affiliated planning for aquatic animal health management that enhances communications, coordination and collaboration between federal, state, private, tribal and university interests;

- Equity and consistency in the development and implementation of aquatic animal health regulations and policies, in diagnostic and inspection/certification services, in the application of technology, in setting research priorities, and in other activities involving interactions between public, private, and tribal aquaculture;

- Development of specific aquatic animal health management programs, based on "Best Management Practices" (BMP), providing for careful stewardship of host, pathogen, and environmental relationships thereby enabling productive aquaculture while preventing adverse impacts on natural aquatic animal populations and associated waters.

When fully implemented, a comprehensive National Aquatic Animal Health Program will include elements and strategies that:

¹. The Joint Sub-Committee on Aquaculture is a sub-committee of the Federal Coordinating Council on Science, Engineering, and Technology. It is composed of representatives of federal agencies including USDA, Dept. of Commerce, Dept. of Interior, Dept. of Health and Human Services, EPA, and others. The JSA recognizes that the general role of government is to provide encouragement and support of aquaculture through programs and services that cannot reasonably be expected from private sources.

- Ensure the availability of diagnostic and inspection/certification services required to facilitate the legal movement of aquatic animal, their eggs and products, in interstate and international commerce and to protect the health and improve the quality and productivity of public and private aquatic animal resources;

- Establish and maintain a system to review and determine the current understanding of aquatic animal diseases, the status and application of disease diagnostic and inspection technology, disease impacts on public and private aquatic animal resources, and make recommendations on regulatory, policy and procedural adjustments;

- Ensure that federal, state, tribal, and private entities and universities collaborate to identify and carry out essential research needed to protect the health and improve the quality and productivity of public and private aquatic animal resources;

- Provide guidelines, model language, or concepts that simplify and clarify federal importations regulations to reasonably ensure protection of public and private aquatic animal resources from the introduction of certain exotic pathogens into the United States;

- Provide guidelines, model language, or concepts (including water-shed approaches) that simplify and clarify federal, state, and other regulations to reasonably ensure protection of public and private aquatic animal resources from the spread of certain endemic pathogens into known non-endemic areas of the United States while assuring reasonable commerce of farmed aquatic products;

- Establish professional standards and the necessary continuing education opportunities, required for aquatic animal health professionals, to provide diagnostic and inspection/certification services to the public and private sectors;

- Encourage development of specific aquatic animal health management programs, based on "Best Management Practices (BMP)", providing for careful stewardship of host, pathogen and environmental relationships thereby enabling productive aquaculture while preventing adverse impacts on natural aquatic animal populations and associated waters;

- Enhance the knowledge and awareness of public and private aquaculturists on all aspects of aquatic animal health such as infectious diseases, the use of drugs, chemicals and biologicals, and the effective use of BMP concepts through strong extension educational programs;

- Establish and maintain information collection and transfer capabilities to ensure that both public and private producers of aquatic animals are informed about the National Aquatic Health Program;

- Maintain direct liaison with the JSA Quality Assurance Task Force to provide current information on the need and priorities for registered and labelled drugs, chemicals, and biologicals essential to the cost-effective prevention and control of the diseases of aquatic animals; and,

- Consider needs for legislative authority, funding and personnel to implement the aquatic animal health strategy.

The benefits accruing from the implementation of the National Aquatic Animal Health Program are expected to include:

- The adoption of measures to ensure the long-term health of public and private aquatic animal

resources of the United States thereby improving the reliability of conservation programs, the success of private enterprise, while ensuring resource integrity and economic viability;

- The development and use of coordinated, standardized, and Nationally consistent disease inspection and certification procedures which facilitate the movement of aquatic animals of their reproductive products within biologically based and agreed upon geographic areas;

- Close coordination and collaboration between government resource managers and private sector interests to prevent adverse impacts of aquaculture on natural aquatic animal populations;

- Enhanced availability and distribution of information on the prevention and control of aquatic animal diseases, to both public and private producers of aquatic animals, that substantially contributes to the implementation of the best management practices.

To advance the development of the National Aquatic Animal Health Strategy, the Core Group recommends that the JSA appoint a Strategy Steering Committee, composed as follows, to oversee activities:

Meryl Broussard, USDA Co-Chair
Jim Warren, USFWS Co-Chair
Kevin Amos, Washington Dept. of Fisheries
Ralph Elston, Battelle Marine Research Lab
Hugh Mitchell, Connors Aquaculture, Inc.
Bob Goetz, Keo Fish Farms
Ken Johnson, Texas A & M University
Phil Mackey, CAA and Mt. Lassen Trout Farm
Joe McCraren, NAA and USTFA
John Pitts, Washington Dept. of Agriculture
John Plumb, Auburn University
Bruce Schmidt, Utah Division of Wildlife Resources
Austin Jones, Moorhead, MS

Early work products from the Steering Committee will include:

1. A final draft of this National Aquatic Animal Health Strategy (Strategy) will be provided by Co-Chairman Meryl Broussard to the Executive Committee of the JSA for review and approval at the May 7, 1992 Excom meeting.

2. A report on this Strategy will be presented by Co-Chairman Meryl Broussard at the May 14, 1992 JSA meeting. Upon JSA approval, an aggressive effort will be made to provide concerned and interested agencies, groups and individuals with copies of the approved Strategy.

3. A status report from Joe McCraren, Chairman of the Aquatic Animal Health Issues and Review Work Group, by June 1, 1992, describing the membership of the Work Group and the proposed Work Group "charge".

4. A report on this Strategy will be presented by Co-Chairman Jim Warren at the annual meeting of the Fish Health Section of the American Fisheries Society at Auburn University, June 17 - 19, 1992 and at the Western Fish Disease Conference in Parksville, BC June 23 - 24, 1992.

5. An informal working breakfast of Steering Committee members attending the Auburn meeting will be held June 19, 1992 to coordinate activities.

6. The next formal meeting of the Strategy Steering Committee will be held October 13 - 14, 1992, just prior to the annual meeting of the U.S. Trout Farmer's Association at Copper Mountain, Colorado.

Florida's Cost of Services List Included as an example of state provided services to the Florida Aquaculture Industry.

Rules of the State of Florida

Department of Agriculture and Consumer Services
Division of Animal Industry

Chapter 5C-13 State Diagnostic Laboratories

5C-13.01	Services Provided.
5C-13.02	Specimen Requirements.
5C-13.03	Research.
5C-13.04	Schedule of Fees.

5C-13.01 Services Provided

1. The services of the large animal and poultry diagnostic laboratories of the State Department of Agriculture and Consumer Services shall be available to owners of domestic animals and poultry in Florida for the purpose of determining the cause and methods of control and eradication of diseases of such domestic animals and poultry.

2. Except in the case of poultry, items for examination must be screened by a state, federal, county, municipal, or practicing veterinarian to determine those actually in need of laboratory work, and must be accompanied by a case history of disease symptoms.

3. Users of the State Diagnostic Laboratories shall be required to pay a fee for all services requested.

4. No specimens will be accepted for testing unless accompanied by a completed laboratory submission sheet prepared by the individual requesting the services.

5. Billings for all services rendered will be mailed once a month to the individual requesting the service.

6. All payments must be made by check or money order made payable to Florida Department of Agriculture and Consumer Services. All payments shall be sent to the Kissimmee Diagnostic Laboratory, P.O. Box 460, Kissimmee, FL 32742.

7. Billings will be due on receipt and should be paid no later than 30 days thereafter. Failure to pay for services rendered will result in loss of services to delinquent individuals.

Specific Authority 585.64, 570.07(23), 585.08(3)(a), F.S.
Law Implemented 585.65 F.S. History-New 6-29-62, Amended 12-25-84

5C-13.03 Research

1. The primary function of the laboratories of the department shall be the diagnosis of diseases of domestic animals and poultry; however, limited research may be performed to assist in the efficient diagnosis and control of such diseases.

2. Research grants to the laboratories may be accepted from governmental or private institutions, subject to the approval of the department of the terms of the grant; provided that all such grants shall comply with applicable rules of the State Department of Administration.

Specific Authority 585.64 F.S. Law Implemented 585.65 F.S. History - New 6-29-62.

5C-13.04 Schedule of Fees

1. Necropsy Fees

a. Mammals - Necropsy fees will normally include gross necropsy, histo-pathological, bacteriological and parasitological examinations. Additional charges will be made on all virological and toxicological examinations deemed necessary by the Diagnostic Veterinarian in charge of the case.

1. Cattle and Horses

Over 250 lbs	\$30.00/animal
Under 250 lbs	\$20.00/animal

2. Swine

Over 250 lbs	\$30.00/animal
20-250 lbs	\$20.00/animal
Under 20 lbs	\$15.00/animal
Feti	\$10.00/animal

3. Sheep and Goats

Over 35 lbs	\$20.00/animal
Under 35 lbs	\$15.00/animal

4. Companion Animals (dogs And cats)

Over 20 lbs	\$25.00/animal
Under 20 lbs	\$20.00/animal

5. Rodents and Rabbits

\$15.00/animal

6. Other Mammals (primates, deer, other species)

\$25.00/animal

7. Miscellaneous Animals

(alligators, etc.)	\$25.00/animal
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b. AVIAN - Necropsy fees will normally include gross necropsy, bacteriological and parasitological examinations. Additional charges will be made on all histopathological, virological and toxicological examinations deemed necessary by the Diagnostic Veterinarian in charge of the case.

1. Poultry (chickens, turkeys, ducks, etc.) and Game Birds

(quail, pheasant, etc.)	\$6.00/Accession
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2. Companion Birds

(psittacine, etc.)	\$15.00/bird
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3. Wild Birds (waterfowl, grackles, etc.)

\$5.00/bird

2. Bacteriology

Aerobic Culture	\$3.00/swab or tissue
Microaerophilic Culture	\$3.00/swab or tissue
Anaerobic Culture	\$3.00/swab or tissue
Mycoplasma Culture	\$3.00/swab or tissue
Campylobacter Culture	\$3.00/tube, swab or tissue
Fungal Culture & Other	
Mycobacteria	\$3.00/sample
Paratuberculosis	
(Johne's) Culture	\$5.00/sample
Mastitis (milk) Culture	\$3.00/sample
Sensitivity Tests	\$2.50/organism
*C.E.M.	\$4.00/animal
FA Identification Clostridia	\$5.00/tissue

Mouse Toxin Test (botulism, etc.) . . .	\$5.00/test
Other Animal Inoculation Tests	\$5.00/test

3. Chemistry/Toxicology

Clinical Chemistry (BUN, SGOT, etc.) . .	\$3.00/test
Urinalysis	\$2.50/sample
Calculi I.D	\$3.00/animal
Heavy Metal Screen	\$5.00/sample
Biological Insecticide Test	\$5.00/sample
Alkaloid Screen	\$5.00/sample
Anticoagulant Screen	\$5.00/sample
UV Screening of Positive Biological Test	\$5.00/test
Heavy Metal Identification	\$5.00/test
Alkaloid Identification	\$5.00/test
Anticoagulant Identification	\$5.00/test
Lead	\$5.00/sample
Thallium	\$5.00/sample
Cyanide	\$5.00/sample
Urea	\$5.00/sample
Nitrate/Nitrite	\$5.00/sample
Paraquat/Diaquat	\$5.00/sample
Copper	\$5.00/sample
Aflatoxin	\$5.00/sample
Other Toxicological Examinations	\$5.00/test
Toxicological Quantitation	\$5.00/test

4. Histopathology

Routine histopathological examination(H & E Stain)	\$5.00/sample
Cytology	\$5.00/sample

5. Parasitology

Fecal Examination	\$2.50/sample
Parasite Identification	\$2.00/parasite
Microfilaria Knott's Test	\$2.50/sample
Occult Heartworm ELISA Test . . .	\$5.00/sample
*Trichomonas Culture	\$3.00/sample
Mare Pregnancy Test	\$5.00/serum
Toxoplasmosis HI Test	\$5.00/serum
Hemoparasite AO Examination (anaplasmosis, Haemobartonella, etc.)	\$3.00/sample
Anaplasmosis Card Test	\$1.00/serum

6. Serology

a. Bacterial Serology

Leptospirosis (5 Serovars) MA Test . .	\$2.00/serum
H. somnus Aggl'n Test	\$2.00/serum
Campylobacter (Vibrio) Aggl'n Test . .	\$2.00/serum
Brucella canis Tube Aggl'n Test	\$5.00/serum
B. abortus Plate Aggl'n Test (non-official)	\$0.50/serum
Mg Plate Aggl'n Test	\$0.50/serum
Mg. HI Test	\$1.00/serum
Ms Plate Aggl'n Test	\$0.50/serum
Ms HI Test	\$1.00/serum
Pullorum - Typhoid Plate Aggl'n Test .	\$0.50/serum

b. Viral Serology

1. Agar Gel Immunodiffusion (acid) Tests

Avian Viral Arthritis (VA)	\$3.50/serum
Bluetongue (BT)	\$3.50/serum
Bovine Leucosis (BLV)	\$3.50/serum
Caprin Arthritis Encephalitis (CAEV) .	\$3.50/serum
Equine Infectious Anemia	
(EIA) - Coggins	\$3.50/serum
Infectious Bursal Disease	
(IBD) - Gumboro	\$3.50/serum
Other Acid Tests	\$3.50/serum

2. Serum Neutralization (SN) Tests

Bovine Respiratory Syncytial Virus (BRSV)	\$1.00/serum
Bovine Viral (mucosal) Disease (BVD) .	\$1.00/serum
Equine Influenza (EI)	\$1.00/serum
Equine Rhinopneumonitis (ERV)	\$1.00/serum
Equine Viral Arteritis EVA	\$1.00/serum
Infectious Bovine Rhinotracheitis (IBR)	\$1.00/serum
Parainfluenza 3 (PI3)	\$1.00/serum
Pseudorabies (PRV)	\$1.00/serum
Transmissible Gastroenteritis (TGE) .	\$1.00/serum
Other SN Tests	\$1.00/serum

3. ELISA Tests

Feline Leukemia (Feleuk)	\$5.00/serum
Rotavirus	\$5.00/serum
Other ELISA Tests	\$5.00/serum

4. Virus Neutralization (VN) Tests

Avian Adenovirus	\$5.00/serum pool
Avian Bronchitis	\$5.00/serum pool
Avian Encephalitis	\$5.00/serum pool
Other VN Tests	\$5.00/serum pool

5. Indirect Fluorescent Antibody Test (IFA)

Canine parvovirus	\$3.00/serum
Equine Arteritis	\$3.00/serum
Equine Rhinopneumonitis	\$3.00/serum
Feline Infectious Peritonitis	\$3.00/serum
Transmissible Gastroenteritis	\$3.00/serum
Other IFA Tests	\$3.00/serum

6. Direct Fluorescent AB Examination

Canine Distemper	\$3.00/test
Canine Parvovirus	\$3.00/test
Canine Coronavirus	\$3.00/test
Bovine Coronavirus	\$3.00/test
Bovine Rotavirus	\$3.00/test
Infectious Bovine Rhinotracheitis . . .	\$3.00/test
Bovine viral Mucosal Disease	\$3.00/test
Porcine Parvovirus	\$3.00/test
Transmissible Gastroenteritis	\$3.00/test
Equine Rhinopneumonitis	\$3.00/test
Other Direct FAB examinations	\$3.00/test

7. Miscellaneous

Equine encephalomyelitis HI (4 viruses)	\$5.00/serum
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7. Virology

Virus Isolation	\$5.00/tissue or swab pool
Viral Characterization	\$5.00/isolate
Chlamydia Isolation	\$5.00/tissue or swab pool
Geminez Stain for Chlamydia	\$3.00/tissue pool

8. Hematology

CBC (PCV, RBC, WBC, DIFFERENTIAL, HEMOGLOBIN)	\$2.50/sample
Modified CBC (PCV, WBC, DIFFERENTIAL, HEMOGLOBIN)	\$2.00/sample
WBC and Differential Count	\$1.50/sample
Differential Count	\$1.00/sample or slide
Heinz Bodies Examination	\$1.50/sample

9. Miscellaneous

Shipment to Other Laboratories for Testing	\$2.50/Accession
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* Transport Medium Furnished by Laboratory

Specific Authority 585.64, 570.17(23), 585.08(3)(a), F.S.
Law Implemented 585.65 F.S. History New 12-25-84.
January 3, 1985

*note - January 1985 price list still in effect today

Maryland's cost of Services List

A second example of state provided services to the Aquaculture Industry

Fish Disease Lab Fee Schedule

A. Bacteriology	In State	Out of State
1. Bacterial Identification		
a. From swab cultures	10	15
b. From live or moribund fish		
small - medium	15	20
large	25	35

For proper diagnosis a minimum of 4 fish should be examined.

Necropsy will include examination for gill and skin parasites. Isolation of bacteria will be attempted from brain, kidney, liver, and any internal or external lesions.

2. Bacterial culture identification. This will refer to a pure culture of an organism that a lab is not able to identify.

Culture ident. of fish isolate	40	60
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3. Antibiotic sensitivity	7.5	10
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B. Virology		
a. Virus Isolation Attempt	30	40
(3 cell lines, 1 blind pass)		
b. Virus identification	35	45

C. Histology		
a. single tissue	7	20
b. multiple tissue	15	40

D. Other Tests

IFAT test for BKD in tissue or sex products	10	15
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E. Fish Disease Inspection for fish to be introduced to Maryland

Includes: necropsy, examination for gill and skin parasites, isolation and identification of bacteria from brain, kidney and liver, virus isolation and identification, IFAT test for BKD from anterior kidney and antibiotic sensitivity for all fish pathogen isolates.

a) group of 20 fish	\$250
b) group of 40 fish	\$400
c) group of 60 fish	\$500

West Virginia statute on the importation of wildlife

§ 20-2-13. Importation of wildlife; certification and inspection of imported wildlife.

No person shall transport into or have in his possession within this State any live wildlife or viable eggs thereof from without the State, except as authorized by an importation permit issued by the director: Provided that the director shall not be authorized to issue a permit to any person to transport into this State any coyotes (*Canis latrans*). The director may issue at his discretion such permit as he is authorized to issue, fix the terms thereof and revoke it at his pleasure.

Importers of fish or viable eggs of the family salmondiae (trout, char. salmon) shall furnish a statement from a recognized fish pathologist certifying the source to be free of whirling disease, infectious pancreatic necrosis, viral hemorrhagic septicemia or other diseases which may threaten fish stocks within the State.

Importers of wildlife species shall furnish disease free certification from pathologists, or veterinarians, as the director deems necessary to protect native populations.

All imported wildlife shall be subject to inspection by authorized agents of the department and such inspections may include biological examinations and the removal of a reasonable sample of fish or eggs for such purposes.

Any person violating any of the provisions of this section concerning coyotes shall be guilty of a misdemeanor, and, upon conviction thereof, shall for each offense be fined not less than one hundred nor more than three hundred dollars, or confined in jail not less than ten nor more than one hundred days, or be both fined and imprisoned within the limitations aforesaid. (1961, c.133; 1963, c. 132; 1971, c. 109; 1982, c. 83.)

CALIFORNIA'S LIST OF PROHIBITED PATHOGENS

List of aquatic animal pathogens and species that are prohibited from entering because of disease concerns. The species that are prohibited because of concern about their becoming established in California (Section 671, Title 14, California Code of Regulations) are not included.

A. Channel catfish (Section 171, Title 14, CCR).

B. Listed fish pathogens (Section 245, Title 14, CCR):

1. Viral Hemorrhagic Septicemia (VHS)
2. Infectious Pancreatic Necrosis (IPN)
3. Channel Catfish Virus (CCVD)
4. Whirling Disease
5. Infectious Hematopoietic Necrosis (IHN)
6. Ceratomyxosis
7. Bacterial Kidney Disease (BKD)
8. *Pleistophora ovariae*
9. Proliferative Kidney Disease (PKD)
10. SSO
11. Microcell Disease of Oysters
12. Furunculosis
13. Enteric Redmouth (ERM)
14. Vibriosis
15. Copepod (*Lernaea*, *Salmincola*, *Ergasilus*)
16. Golden Shiner Virus
17. Oyster Fungus Disease
18. MSX Oyster Disease
19. Ichthyophonus
20. Viral Erythrocytic Necrosis (VEN)
21. Herpesvirus salmonis (HPV)
22. Spring Viremia of Carp
23. *Edwardsiella ictaluri*
24. Denman Island Disease of Oysters

WYOMING'S LIST OF PROHIBITED PATHOGENS

Pathogens List:

1. Ceratomyxosis of Salmonids - *Ceratomyxa shasta*
2. Infectious Hematopietic Necrosis - I.H.N. virus
3. Infectious Pacreatic Necrosis of Salmonids - I.P.N. virus
4. Proliferative Kidney Disease (PKD)
5. Rhabdovirus Disease of northern Pike Fry - PFR
6. Spring Viremia of Carp - Rhabdovirus carpio
7. Virgal Hemorrhagic Septicemia of Salmonids - V.H.S. virus
8. Virus Disease of Oncorhynchus Masou - OMV
9. Bacterial Kidney Disease of Salmonids - *Renibacterium salmoninarum*
10. Enteric Redmouth - *Yersinia ruckeri*
11. Furunculosis - *Aeromonas salmonicida*
12. Whirling Disease of Salmonids - *Myxobolus cerebralis*
13. Any other pathogen - disease designated by the Wyoming Game and Fish Department.

APPENDIX C

Contents:

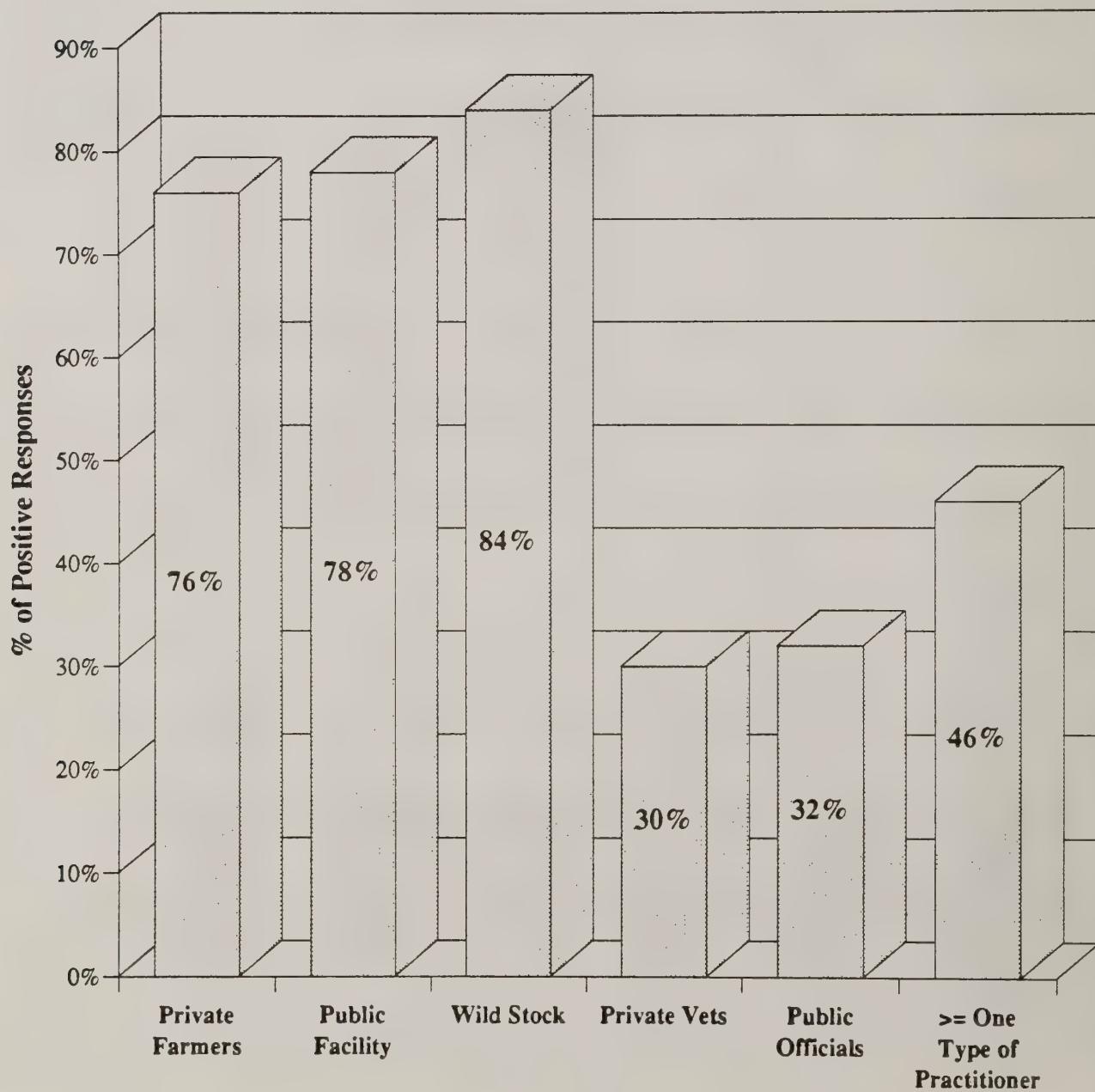
- Table I and Figure 1
- Table II
- Table III and Figure 2
- Table IV and Figure 3
- Table IVa
- Table V
- Table VI and Figure 4
- Table VII with Figure 5
- Table VIII with clarification
- Table IX with clarification and most reported species list
- Illinois' list of private production
- National production figures for 1980 to 1990

Table I - Does your state provide aquatic animal health services?

State	Private Farmers	Public Facility	Wild Stock		Private Veterinarians	Public Officials
AL	Yes	Yes	Yes		Yes	n/a
AK	Yes	Yes	Yes		n/a	n/a
CA	Yes	Yes	Yes		Yes	n/a
CO	Yes	Yes	Yes		n/a	n/a
CT	Yes	Yes	Yes		n/a	n/a
DE	n/a	n/a	Yes		n/a	n/a
FL	Yes	Yes	Yes		Yes	Yes
GA	Yes	Yes	Yes		Yes	Yes
HI	Yes	Yes	Yes		Yes	Yes
ID	Yes	Yes	Yes		n/a	n/a
IL	Yes	Yes	Yes		Yes	Yes
IN	Yes	n/a	Yes		Yes	Yes
IA	Yes	Yes	Yes		n/a	Yes
LA	Yes	Yes	Yes		n/a	n/a
ME	Yes	Yes	Yes		Yes	n/a
MD	Yes	Yes	Yes		n/a	Yes
MI	Yes	Yes	Yes		n/a	n/a
MN	Yes	Yes	Yes		n/a	n/a
MO	Yes	Yes	Yes		n/a	n/a
NE	n/a	n/a	n/a		n/a	n/a
NJ	Yes	Yes	Yes		Yes	Yes
NY	n/a	Yes	Yes		n/a	Yes
NC	Yes	Yes	n/a		n/a	n/a
ND	n/a	n/a	n/a		n/a	n/a
OH	n/a	n/a	Yes		n/a	n/a
PA	n/a	n/a	n/a		n/a	n/a
SC	Yes	Yes	Yes		n/a	n/a
SD	Yes	Yes	Yes		n/a	n/a
TN	Yes	Yes	Yes		n/a	n/a
TX	Yes	Yes	Yes		Yes	n/a
VA	Yes	Yes	Yes		n/a	Yes
WA	Yes	Yes	Yes		n/a	n/a
WV	n/a	n/a	n/a		Yes	n/a
WI	Yes	Yes	Yes		n/a	Yes
WY	Yes	Yes	Yes		n/a	Yes
PR	n/a	Yes	Yes		n/a	n/a
GU	n/a	n/a	n/a		n/a	n/a

See Figure 1 for Graphic Representation. n/a = Information not available.

Figure 1 - Responses to the Provision of Aquatic Animal Health Services.



	Bacteriology	Antimicrobial Sensitivity Testing	Virology	Parasitology	Histopathology	Mycology	Nutritional Diseases	Toxicology	On-farm Assistance	Health Certification	Triplody Certification	Educational Programs	Other (specify)
AL	1-4.	1-4.	1-4.	1-4.	1-4.	1-4.	1-4.	1-4.	1-4.	2-4.		1-4.	
AK	11		11	11	11	11	11	11					
CA	17-19	17-19	17-19	17-19	17-19	17-19	17	18	17	17-19		18,19	
CO	22,23	22,23	22,23	22,23					22,23	22,23		22,23	
CT													26,27
DE	31	31	31	31	31	31	31	31	31		31	31	31
FL	36,37,40-50	36,37,40-50	37,40,50	36-49	36,37,40-50	36,37,40,42-45,47,48	37,40	36-40,42,46	36-40,42-45,47,48	40-45,47-49	40	36,38-40	36,40,46
GA	53-56	53-56	53-55	53-56	54-56	53,55,56	54	54,55	53,54	53	53	53,54	55
HI	58,60	58,60	58	58,60	58,61	58,60	58	58	58	58		58	63
ID	65-67	65-67	65-67	65-67	65-67	65-67	65-67	66,67	65	65			
IL	73-75,77	73-75	73-75	73-75,77	73-75	73-75	73,75,77	73,75,76	73,77	73,77	73,75	73,77	77
IN	78	78	78	78	78	78		78				78	
IA	81,82	81		82	81			81					
LA	88	88	88	88		88	88		88			88	
ME	90-94	91	90-92,94	90-94	91,92	90-92	91,92,94	91	90-94	90,91,93,94			
MD	96,97	97	97	96,97	96					96,97		97	
MI	101	101	101	101									
MN	103			103	103								
MO	105-109	105-109		105-109			105-109		105-109	105-109		105-109	
NE													n/a
NJ	114-115a			115	114-115a				114,115a	115		114	
NY	116	116	116	116	116	116	116	116		116			
NC	119-128	119-128	121	119-128	120,121,123	119-128		119,120-123,126	119			119,120	
ND	129	129		129	129	129						129	

*Note: See Appendix for laboratories corresponding to numbers. n/a = Information not available.

Table II - Providers of Aquatic Animal Health Diagnostic Services.

[illegible]

Table III - Services of Traditional (livestock and poultry) laboratories for aquafarmers.

State	Private Aquafarmers		Public Hatcheries		Resources Needed:	Training	Facilities	Equipment	Funding	Additinal Staff	Other
	Yes	No	Yes	No							
AL	5-7.		5-7.								
AK		12		12			12	12	12	12	
CA		20		20					20		20
CO											*
CT											28*
DE		32-35		32-35		32-35		32	32-35		
FL	50,51		50,51								
GA	55		55								
HI		64		64		64	64	64	64	64	64
ID		69,70		69,70		69,70	70	70	69,70	69,70	70
IL	75		75	75		75					
IN	79		79								79
IA		82,83		82,83		82,83	82,83	82,83	82,83	82,83	
LA	89		89								
ME	95		n/a	n/a							
MD		98		98		98		98	98		
MI	102			102							
MN											*
MO		110,111		110,111		110	110	110	110	110	
NE	113		113			113					
NJ	115		115								
NY		117		117		117	117	117	117	117	117
NC	123-128		123-128								
ND	130		130			130			130	130	
OH		131		131		131	131	131	131	131	131
PA		135,136		135,136		135	135	135	135	135	135
SC		140		140		140			140	140	140
SD		143		143							
TN		146		146		146	146	146	146	146	146
TX	149		149								149
VA	155-160		155-160								
WA											n/a
WV		174		174		174	174	174	174	174	
WI		179		179		179	179	179	179	179	
WY	183		183								
PR											*
GU		187		187		187	187	187	187	187	

***Note:** See Appendix for laboratories corresponding to numbers.

***** = No laboratory listed, everything needed.

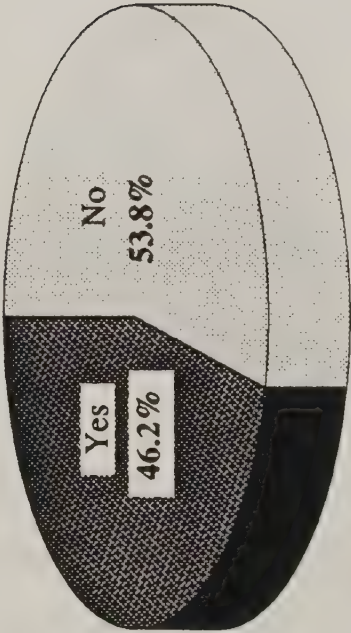
****** = Laboratory listed but information not available.

n/a = Information not available.

See Figure 2 for Graphic Representation

Figure 2 - Do Your Health Laboratories (livestock, poultry) Provide Services?

For Private Aquafarmers?



For Public Hatcheries?

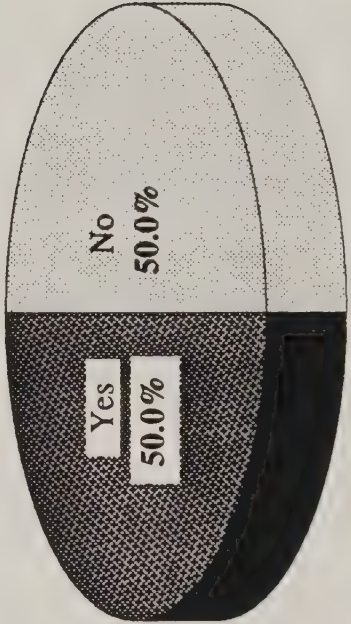


Table IV - State Veterinary Schools. Courses and Services Offered?

State	Are Courses Offered?		Are diagnostic/lab services Offered?				Others
	Yes	No	To aquafarmers?	To public hatcheries?	Yes	No	
AL	8,9			8,9		8,9	n/a
AK							none
CA	21		n/a	n/a	n/a	n/a	n/a
CO		24		24		24	n/a
CT							none
DE		34		34		34	n/a
FL	36,52		36	52	36		
GA	57		57		57		n/a
HI							none
ID	72	71	71,72		72	71	
IL	74		74		74		n/a
IN		80	80		80		n/a
IA	85	84	84	85	84	85	n/a
LA	89		89		89		n/a
ME							none
MD		99		99		99	
MI	n/a	n/a	102a			102a	n/a
MN		104		104		104	n/a
MO		111		111		111	n/a
NE	113		113		113		n/a
NJ							none
NY	118		118			118	n/a
NC	120		120		120		
ND							none
OH							none
PA	136a	135,137	136a	135,137	136a	135,137	n/a
SC							none
SD		144		144		144	n/a
TN		147		147		147	
TX	150		150		150		
VA	151		151		151		
WA	171			171		171	n/a
WV		175		175		175	n/a
WI		180		180		180	
WY	184		184		184		n/a
PR							none
GU							none

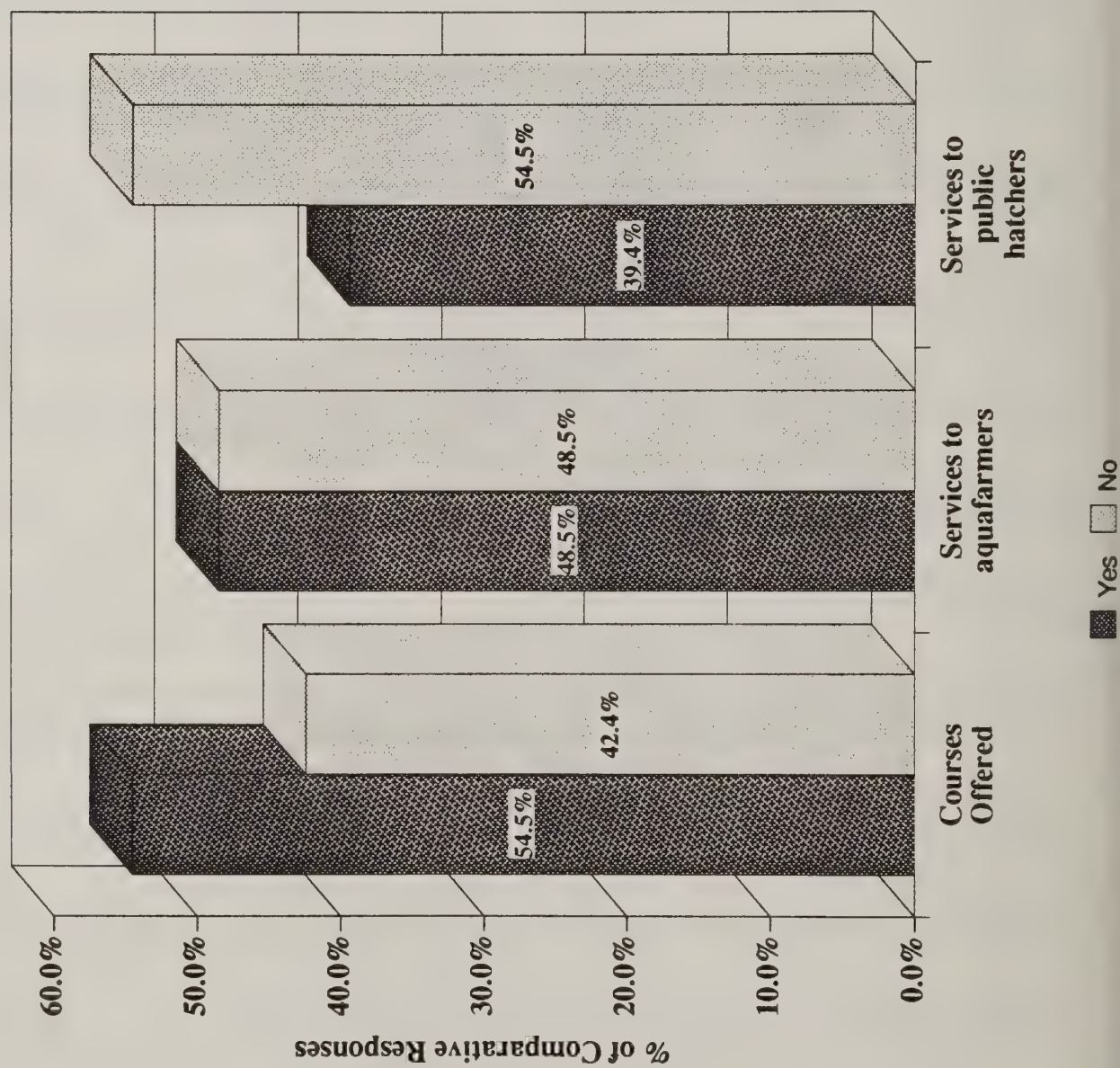
*Note: See Appendix for laboratories corresponding to numbers.

n/a = Information not available

None = No veterinary schools in state/territory

See Figure 3 for Graphic Representation

Figure 3 - Response to Veterinary Schools, Courses and Services Offered.



**Table IVa - Aquatic Animal Medicine Expertise in Colleges of
Veterinary Medicine (as of April 1992) ****

Institution	No. of FTE +	Coursework offered	No. of Veterinary students*	No. of graduate students
Auburn	3.2	Y	5/80	1
California	2	Y	20/130	12
Colorado	0.5	Y	80/125	0
Cornell	3	Y	10/80	4
Florida	2	Y	80/80	0
Georgia	0.5	Y	30/80	2
Illinois	1	Y	35/80	0
Iowa	0	N	0/100	0
Kansas	0	N	5/90	0
Louisiana	4.5	Y	64/64	9
Michigan	0	N	1/100	1
Minnesota	0.4	Y	15/60	0
Mississippi	8.9	Y	45/45	9
Missouri	0.2	N	1/64	1
Montreal	0.5	N	2/74	0
North Carolina	2	Y	72/72	6
Ohio	0	N	2/130	0
Oklahoma	0.2	Y	25/70	0
Ontario	4.5	Y	100/100	5
Oregon	0.1	Y	10/36	0
Pennsylvania	3.7	Y	45/109	1
PEI	9	Y	50/50	9
Purdue	1	Y	10/60	1
Saskatchewan	0	N	3/70	1
Tennessee	0	Y	2/60	0
Texas	3	Y	30/120	5

Tufts	1	Y	7/70	0
Tuskegee	0.25	Y	60/60	1
Virginia-Maryland	1.5	Y	80/80	2
Washington	0	Y	7/60	0
Wisconsin	0	Y	15/80	0
TOTALS	52.95	24 - Y 7 - N	911/2479	70

Note:

Data are representative of the 1991-1992 school year. Y = yes; N = no

FTE+ = Full-time-equivalent appointments. * No. of students in course/total No. of students.

** Source: Journal of American Veterinary Medical Association.

	Bacteriology	Antimicrobial Sensitivity Testing	Virology	Parasitology	Histopathology	Mycology	Nutritional Diseases	Toxicology	On-farm Assistance	Health Certification	Triplody Certification	Educational Programs	Other (specify)
AL													*
AK													*
CA	162	162	162	162	162	162	162	162	162	162	162	162	
CO					112								
CT													138* 96*, 113*
DE	96			96	96					96			*
FL	29		29	29	29					29, 150a			
GA	10	10	10	10	10	10	10	10	10	10		10	
HI	86		13	13									
ID													*
IL	15	15	15	15	15		15			15	15	15	
IN	181		181	181			181			181			
IA	15	15	15	15			15	15	15	15	15	15	
LA	14	14	14	14	14	14	14		14			14	
ME	188		188	188	188					188			
MD	176	176	176	176	176		176	176				176	
MI													*
MN													181*
MO	1,16,182	1,16,182	1,16,182	1,16,182	1,16,182	1,16,182	1,16,182	1,16,182		1,16,182	1,16,182	1,16,182	
NE													*
NJ	30,96,100,138	138	138	30,96,100,138	30,96,100		30,96,100		30,96,100	138		30,96,100	
NY	138	138	138	138	138		138			138		138	
NC													*
ND	25	25	25	25	25		25			25		25	

*Note: See Appendix for laboratories corresponding to numbers; * = No out-of-state labs used; #* = Lab services information not available.

Table V - Utilization of out-of-state aquatic animal health laboratories.

	Bacteriology	Antimicrobial Sensitivity Testing	Virology	Parasitology	Histopathology	Mycology	Nutritional Diseases	Toxicology	On-farm Assistance	Health Certification	Triploidy Certification	Educational Programs	Other (specify)
OH													78*,181*
PA													*
SC													*
SD	22	22	22	22		22							
TN	16		16	16	16								
TX													*
VA	177	177	177	177	177	177	177					177	177
WA	133		133	133						133	133		
WV	138	138	138	138	138	138	138	138					
WI	112,164,165,177	112,164,165,177	164,165,177	112,164,165,177	112,164,165,177,185	112,164,165,177	112,164,165,177			164		112,164,165,177	112,165,177
WY	22	22	22	22	22	22	22		22	22		22	*
PR													
GU	58		58	58	58	58	58						

State	Entering the State?		Leaving The State?		Shipped within state?		Released in public waters?		Fees Charged?	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
AL		x		x		x		x		x
AK	x			x	x		x			x
CA	x			x	x			x		
CO	x			x	x		x			x
CT	x		n/a	n/a	n/a		x			x
DE	x			x		x		x		x
FL	x			x		x				x
GA		x		x		x				x
HI	x			x	x					x
ID		x		x		x		x		x
IL	x	x		x		x		x		x
IN	x			x	x			x		
IA	x			x		x				x
LA	x			x		x				x
ME	x			x	x			x		
MD	x			x		x				x
MI	x			x		x		x		
MN	x		n/a	n/a	n/a			x		
MO	x			x		x		x		x
NE		x		x		x		n/a		n/a
NJ		x		x		x		x		x
NY		x		x		x				n/a
NC		x		x		x				n/a
ND	x			x		x				x
OH		x		x		x				n/a
PA		x		x		x				
SC		x		x		x				n/a
SD	x			x		x				x
TN		x		x		x				x
TX	x			x		x		x		
VA		x		x		x				x
WA	x		x		x					x
WV	x			x		x				
WI	x			x		x				x
WY	x			x		x				x
PR		x		x		x				n/a
GU	x			x		x				x

Note: x = Response; n/a = Information not available -- See Figure 4 for Graphic Representation.

Figure 4 - Responses to Health Certification Policies.

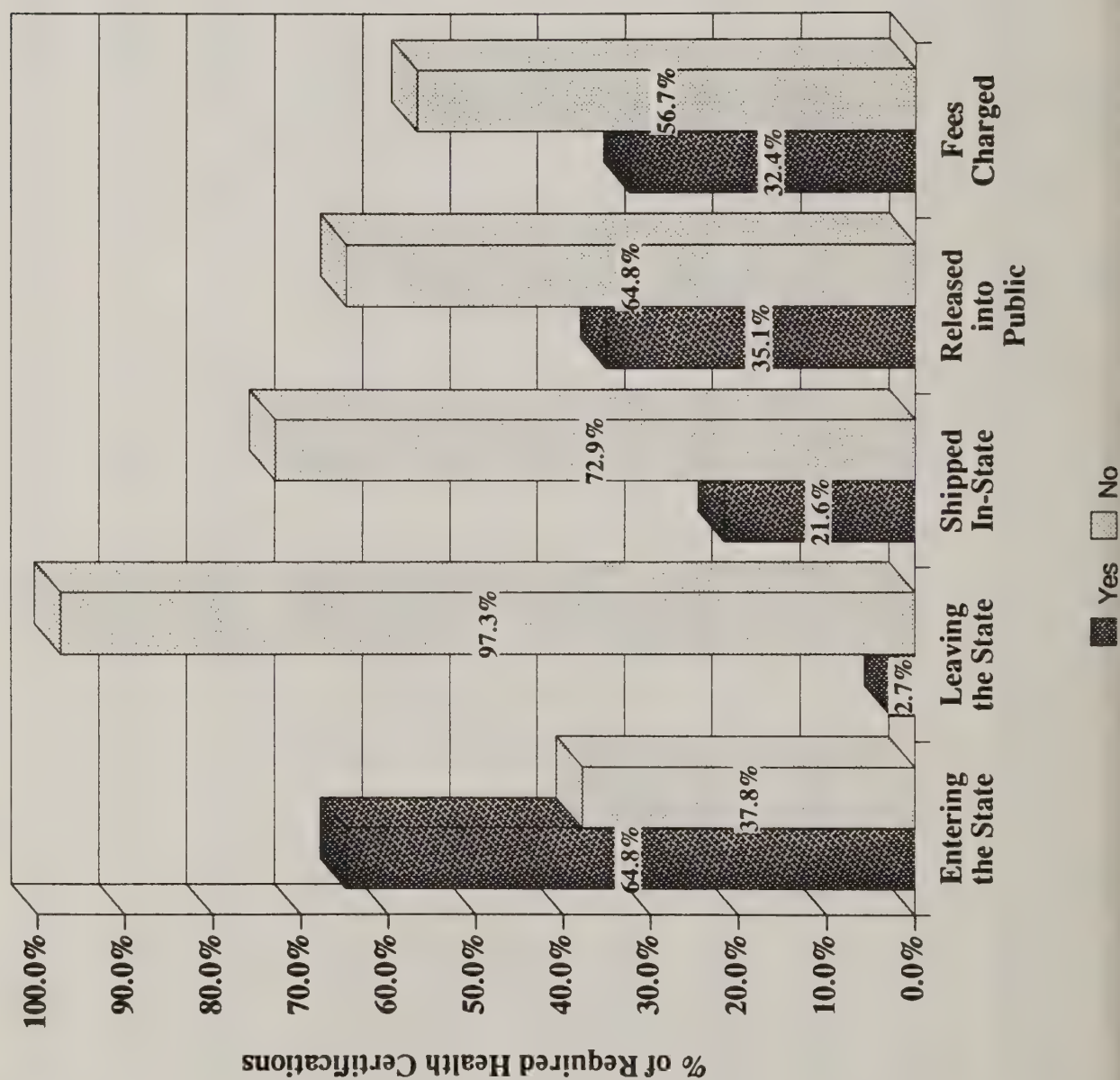


Table VII - States that have listings of animal pathogens or species that are prohibited from introduction into state waters.

State	Response		State	Response		State	Response		State	Response
AL	No		ID	No		MO	Yes		SD	Yes
AK	Yes		IL	No		NE	n/a		TN	n/a
CA	Yes		IN	No		NJ	Yes		TX	No
CO	Yes		IA	Yes		NY	n/a		VA	Yes
CT	No		LA	No		NC	n/a		WA	Yes
DE	Yes		ME	Yes		ND	No		WV	Yes
FL	No		MD	Yes		OH	No		WI	Yes
GA	No		MI	Yes		PA	Yes		WY	Yes
HI	n/a		MN	Yes		SC	n/a		PR	No
									GU	No

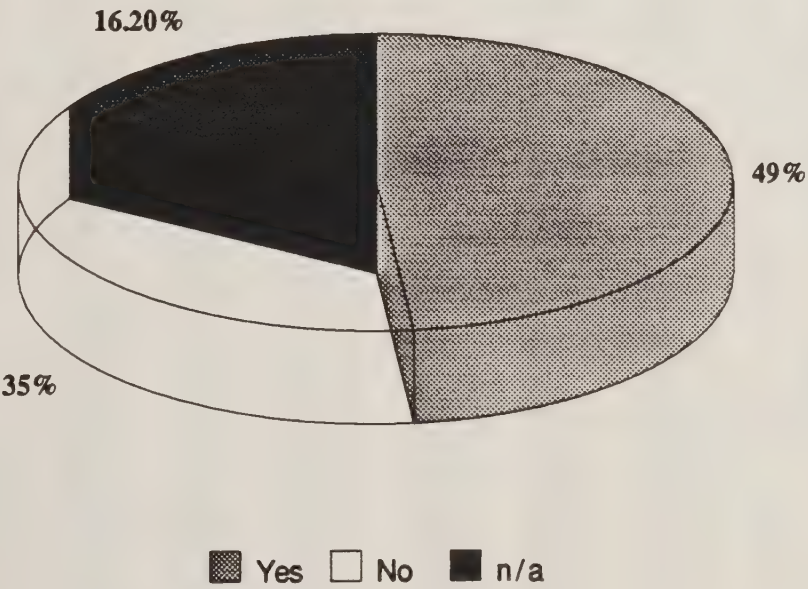


Table VIII
Clarification of others column from Table VIII

Other species column includes:

Abalone seed
Alligators
Blue gill
Largemouth Bass
Hybrid striped bass
Grass carp
Bighead carp
Black crappie
White crappie
Red-claw crayfish
Gamefish
Prawn
Hybrid sunfish
Redear sunfish
Turtles
Walleye

*Production numbers for hatcheries are not able to be combined without listing each individual study.

Table IX - Summary of Private Grow-Out Facilities per State by Species.

State	Catfish	Trout	Salmon	Crawfish	Striped Bass	Tilapia	Bait-fish	Coldwater Orna.	Tropical Orna.	Sturgeon	Oysters	Clams	Shrimp	Others
AL	380	1		12	4	3	10	4						162
CA	19+	16+	1		7	2+	9+			4	8+			17+
CT		10					8				25	25		
DE				1								1		2
FL	61			1		8			193		24	41		68
GA	280	12		3	3	1	4		5					
HI	4	3	1			9			7		1	2	5	31
IL	54	1		14	3	15	26	3		1				161
IA	14	3				1								7
LA	246			1500	7		70		2		1725			926
ME		14	2				3							17
MD	32	4		12	50	12		3			10			4
MN							80							40
MO	125													
NJ											3			
NY		37												
SD		4					200							5
TN	110	40					10							
TX	314			18	6	16	11		7				8	38
VA	61	26			24	1						6		
WV	3	18					2		3					6
WI		61												
WY		5					1							
PR						2			2				3	1
GU						3							2	7

Table IX - Clarification of Others column from Table IX

Other species column includes:

Abalone	Eels
Alligators	Feeder Guppies
Aquatic plants	Feeder Goldfish
Bream	Fresh water Prawns
Bullfrogs	Fresh water Shrimp
Bullheads	Fresh water Snails
Smallmouth Bass	Giant Malaysian Prawn
Largemouth Bass	Gamefish
Bluegill (pure)	Musky
Hybrid Striped Bass	Millet
Bigmouth Buffalo	Mussels
Carp	Northern Pike
Grass Carp	Paddlefish
Bighead Carp	Redear
Triploid Grass Carp	Red Drum
Crappie	Threadfin Shad
Red Claw Crayfish	Green Sunfish
Soft Shelled Crawfish	Turtles
Soft Shelled Crabs	Common Snapping Turtle
Flat Head Catfish	Walleye
Chinese Catfish	
Blue Catfish	
Crocodilians	

Table IX - Most Frequently Reported Species on a National Level

Catfish
Trout
Tilapia
Baitfish

* List obtained from Table IX for example: 14 states reported producing catfish.

Illinois Private Production

**95 licensed producers harvested over 720,000 pounds of
aquacultured products in 1991**

List of species or class in production:

Channel Catfish
Largemouth Bass
Bluegill
Tilapia
Baitfish
Crocodylians
Walleye
Sturgeon
Yellow Perch
Hybrid Bluegill
Smallmouth Bass
Bullheads
Bullfrogs
Striped Bass
Hybrid Striped Bass
Coldwater Ornementals
Crappie
Trout
Crawfish
Duckweed
Carp

Grass Carp
Bighead Carp
Musky
Northern Pike
White Sucker
Threadfin Shad
Redear
Blue Catfish
Bigmouth Buffalo
Paddlefish
Watercress
Waterchestnuts
Flathead Catfish
Common Snapping Turtle
Giant Malaysian Prawn
Tiger Musky
Green Sunfish
White Bass

U.S. Private Aquaculture Production for 1980-90 ¹

Units = 1,000 pounds ²

	1980	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Baitfish ³	22,046	22,046	22,046	23,598	24,807	25,247	27,000	28,000	30,000	32,000	32,000
Catfish	76,842	200,419	220,000	239,800	271,357	326,979	375,000	390,000	430,000	460,000	475,000
Clams	561	645	1,689	1,698	1,588	2,506	3,300	4,000	4,000	4,000	4,000
Crawfish	23,917	55,115	60,000	59,400	64,999	97,500	105,000	105,000	100,000	90,000	90,000
Freshwater prawns	300	400	275	317	267	178	150	250	250	250	250
Mussels	NA	364	775	917	928	1,206	1,800	2,400	2,500	2,500	2,500
Oysters	23,755	21,777	23,300	24,549	22,473	24,090	26,000	27,500	25,000	25,000	25,000
Pacific salmon	7,616	25,554	20,600	45,086	84,305	74,398	80,000	87,000	85,000	92,000	92,000
Shrimp	NA	NA	255	528	440	1,354	1,500	2,500	2,500	3,000	3,500
Trout	48,141	48,100	48,400	49,940	50,600	51,000	59,000	64,000	67,000	67,000	69,000
Other Species	NA	5,000	7,000	9,900	14,000	15,500	68,000	77,000	80,000	85,000	85,000
Total	203,178	379,410	404,340	455,733	535,764	619,958	746,950	787,650	826,250	860,750	878,250

¹ Source: Economic Research Service, U.S. Department of Agriculture.

² Data shown are live weight except for oysters, clams, and mussels which are meat weight. Excluded are eggs, fingerlings, etc., which are intermediate product.

³ Not used for food consumption.

NA = Not available.

Note - Some data were not used so that the confidentiality of the person or business submitting the statistics would not be disclosed.

U.S. Private Aquaculture Production for 1980-90 ¹

Units = 1,000 dollars

	1980	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Baitfish ²	44,00	44,000	44,000	47,045	51,280	51,522	56,000	58,250	55,000	55,000	55,000
Catfish	53,572	120,000	132,000	191,840	189,194	228,886	285,000	310,000	355,000	370,000	330,000
Clams	2,295	2,637	9,500	4,178	4,717	8,307	11,600	13,250	14,000	14,000	14,000
Crawfish	12,951	27,000	30,000	29,700	32,500	48,750	53,000	53,000	50,000	55,000	57,000
Freshwater prawns	1,200	1,800	1,500	1,698	1,540	893	750	1,250	1,000	1,000	1,000
Mussels	NA	1,600	1,500	1,584	1,248	1,725	2,575	3,400	3,500	3,500	3,500
Oysters	37,085	34,000	31,500	38,970	39,977	42,797	46,190	48,855	52,000	50,000	50,000
Pacific salmon	3,400	4,000	6,800	17,252	25,439	32,751	37,000	42,250	40,000	40,000	45,000
Shrimp	NA	NA	874	1,566	1,687	3,408	3,775	6,300	7,000	7,000	7,000
Trout	37,474	48,000	50,000	54,435	55,154	55,590	65,000	70,000	75,000	81,000	75,000
Other species	NA	5,000	7,000	9,900	20,000	21,700	85,000	89,000	85,000	85,000	90,000
Total	191,977	288,037	314,674	398,168	422,736	496,329	645,890	695,555	737,500	761,500	727,500

¹ Source: Economic Research Service, U.S. Department of Agriculture.

² Not used for food consumption.

NA = Not available.

Note - Some data were not used so that the confidentiality of the person or business submitting the statistics would not be disclosed.

APPENDIX D

Contents:

- The list of providers of Aquatic Animal Health Services

The following appendix corresponds to Tables II, III, IV, V in Appendix C. It contains aquatic animal health diagnostic laboratories, traditional animal laboratories, state veterinary schools and out-of-state aquatic animal health laboratories identified a resources for diagnostic services.

PROVIDERS OF AQUATIC ANIMAL HEALTH SERVICES

ALABAMA

1. Auburn University
Dept. of Fisheries & Allied Aquaculture
Dr. E. W. Shell, Administrator
203-B Swingle
Auburn University, AL 36849
205-844-4786
Clients: Private Farms, Univ. Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums.
No Fees.
2. Auburn University
Dr. Yolanda Brady, Dr. John Plumb, Dr. Wilmer Rogers
Swingle Hall
Auburn, AL 36849
205-844-04786 Fax: 205-844-9208
Clients: Private Farms, Univ. Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums.
No Fees.
3. Alabama Fish Farming Center
Mr. William Hemstreet
Alabama Highway 69 North
Greensboro, AL 36744
205-624-4016 or 1-800-423-5966
Clients: Private Farms, Univ. Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums.
No Fees.
4. Alabama Cooperative Extension Service
Mr. Chris Hyde
Courthouse, 5th Floor
302 Lee St., P.O. Box 1904
Decatur, AL 35602
Clients: Private Farms, Univ. Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums.
No Fees.
5. C. S. Roberts Veterinary Diagnostic Laboratory
Dr. Fred Hoerr
P.O. Box 2209
Auburn, AL 36831-2209
202-844-4987 Fax: 205-826-3592
6. State Diagnostic Lab
Dr. A. R. Sharpton, Jr.
501 Usury Ave.
Boaz, AL 35957
205-593-2995
7. Bryan Taylor Diagnostic Lab.
Dr. William O. Cowart
495 State Road 20
Elba, AL 36323
205-897-6340
8. Dr. H. T. Vaughan (Dean)
Auburn University
School of Veterinary Medicine
104 Greene
Auburn University, AL 36849
205-844-4546
9. Dr. Saul Wilson
Tuskegee University
School of Veterinary Medicine
Tuskegee, AL 36088
205-727-8940
10. Southeastern Cooperative Fish Disease Unit
Auburn University
Dr. W. A. Rogers
203 Swingle Hall, Fisheries Dept.
Auburn University, AL 36849-5419
205-844-9307 or 4786

ALASKA

11. Alaska Dept. of Fish & Game
Mr. Theodore Meyers
P.O. Box 25526
Juneau, AK 99802
907-465-3577 Fax: 907-465-3510
Clients: Private Farms, Univ. Research, State
Hatcheries, Public Aquariums, Federal Facilities.
No Fees.
12. Dept. of Natural Resources
Division of Agriculture
Frank Mielke, Director
915 South Bailey, P.O. Box 949
Palmer, AK 99645-0949
907-745-7200

ARIZONA

13. Dept. of Veterinary Science
Aquaculture Pathology Section
Dr. Donald Lightner
University of Arizona
Administration Office
202 Building 90
Tucson, AZ 85721
602-621-2355 Fax: 602-621-6366

ARKANSAS

14. University of Arkansas/Pine Bluff
Mr. Steve Killian
Arkansas Cooperative Extension Service
Lake Village, AR 71653
15. USFWS Fish Farming Experimental
Dr. Drew Mitchell, Mr. Bo Collins
P.O. Box 860
Stuttgart, AR 72160
501-673-4483
Clients: Private Farms, Univ. Research, State Hatcheries
Private Aquarium Stores, Public Aquariums
No Fees.
16. USFWS - Fish Farming Experimental Station
Dr. Harry Dupree, Administrator
P.O. Box 860
Stuttgart, AR 72160
501-673-8761

CALIFORNIA

17. California Dept. of Fish and Game
Mr. Dan Manzer
Fish Disease Laboratory
211 Nimbus Rd.
Rancho Cordova, CA 95670
916-355-0811 Fax: 916-355-7102
Clients: Private Farms, Univ. Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums,
Ornamental Ponds (public & private).
Fees. Amount under decision.
18. University of California
Mr. Ron Hendrick
School of Veterinary Medicine, Dept. of Medicine
Univ. of California
Davis, CA 95616
916-752-3411 Fax: 916-752-8111
Clients: Private Farms, Univ. Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums,
Federal hatcheries.
Fees. Available at request.

19. U.S. Fish and Wildlife Service
Mr. Scott Foote
Coleman National Fish Hatchery
Rt. 1, Box 2105
Anderson, CA 96007
916-365-8622
Clients: Private Farms, Univ. Research, State
Hatcheries, Federal Hatcheries.
No Fees.

20. Calif. Veterinary Diagnostic Lab. System
Alex Ardans, D.V.M., MS Director
P.O. Box, 1770, Univ. of California
Davis, CA 95617-1770
916-752-7576 Fax: 916-752-5680
21. School of Veterinary Medicine
Dr. F. Murphy, Dean
Univ. of California
Davis, CA 95616
916-752-1360 Fax: 916-752-6363

COLORADO

22. U.S. Fish and Wildlife Service
Fish Disease Control Center
Mr. Dennis Anderson
1100 Burlington Ave.
Ft. Morgan, CO 80701
303-867-9474 Fax: 303-847-7285
Clients: Private Farms, State Hatcheries.
No fees, unless USFWS passes costs down.
23. Division of Wildlife
State Fish Health Lab
Mr. Peter G. Walder or Mr. Bob Kingswood
P.O. Box 128
303-842-2819 Fax: 303-842-2849
Clients: Private Farms, State Hatcheries.
No Fees.
24. Dr. Howard Martin, DVM
Colorado State University
College of Veterinary Medicine & Bio. Med. Science
Ft. Collins, CO 80523
303-221-4535 Fax: 303-491-1275
25. U.S. Fish & Wildlife Service
Fish Disease Control Center
Mr. Andy Anderson
P.O. Box 917
Fort Morgan, Co 80701
303-867-9474 Fax: 303-847-7285

CONNECTICUT

26. Connecticut Dept. of Agriculture (Shellfish)
Mr. John H. Volk, Director Aquaculture Division
P.O. Box 97
Bilford, CT 06460
203-874-0696 Fax: 203-783-4217
Clients: Private Farms, State Hatcheries.
*(General services limited)
No Fees.
27. Connecticut Dept. of Environmental Protection (Finfish)
Mr. James Moulton
Inland Fisheries
State Office Building
165 Capital Ave.
Hartford, CT 06160
Clients: Private Farms, State Hatcheries
*(General services limited)
No Fees.
28. University of Connecticut
Pathogen Biology Lab
Dr. Sven Nielsen
College of Agriculture
Storrs, CT 06268
203-486-2000
29. NOAA/Milford Laboratory (clams & oysters)
Dr. Louis Leibovitz
212 Rogers Ave.
Milford, CT 06460
203-783-4235
Clients: Private Farms, Univ. Research, State
Hatcheries, Public Aquarium.
Fees not available.
30. NMS Milford Lab
Mr. Walter Blogoslawski
Milford, CT
Clients: Private Farms, University Research.
No fees

DELAWARE

31. Division of Fish & Wildlife
Mr. Roy Miller
P.O. Box 1401
Dover, DE 19903
302-739-3441
Client: Private pond owners upon request, Fish Kill
Investigation.
No fees.

32. Delaware Dept. of Agriculture
H.W. Towers, Jr., D.V.M.
2320 S. Dupont Hghwy.
Dover, DE 19902
302-739-4811 Fax: 302-697-6287

33. University of Delaware
College of Agriculture Sciences
R.D. #2, Box 47
Georgetown, DE 19947
302-856-7303

34. University of Delaware
College of Agriculture Sciences
Dr. Jack Rosenberger
302-831-2524

35. DNREC Technical Services Lab.
Dr. Harry Otlo
P.O. Box 1401
Dover, DE
302-759-4771

FLORIDA

36. University of Florida Cooperative Extension
Ms. Ruth Francis-Floyd, DUM, MS
7922 NW 71st St.
Gainesville, FL 32606
904-392-9617 Fax: 904-392-3462
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Petfish
Additional services: Hematology, Serum chemistry.
Lab fees only.
37. University of Florida - College of Veterinary Medicine
Dr. Paul Cardeilhac
P.O. Box J-6, JHMHC
Gainesville, FL 32610
904-392-9318 Fax: 904-392-3766
Clients: (Alligator farms only) Private Farms, State
Hatcheries, Public Aquariums
Annual fee charged to contract farms
38. University of Florida Cooperative Extension
Mr. Craig Watson
Hillsboro County Extension Office
5339 St. Rd. 579
Seffner, FL 33584
813-621-5605
Clients: Private Farms, Private Aquarium Stores.
No fees.

39. University of Florida Cooperative Extension
Dr. Andy Lazur
Northwest Florida Aquaculture Demonstration Farm
Rt. 2, Box 754
Blountstown, FL 32424
904-674-3184 Fax: 904-674-3366
Clients: Private Farms, State Hatcheries.
No fees.
40. Shamrock Veterinary Clinics & Fisheries
Mr. Hank Stoddard, D.V.M., DTVM
P.O. Box 1620, Hwy C3519
Cross City, FL 32628
904-498-5293 or 7244 Fax: 904-498-2933
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, State and
Federal Research Institute.
Additional services: Hematology, Serology.
Fees vary upon services and lab.
41. Veterinarian
Dr. Sandy Yosha
12945 Longview Circle
Jacksonville, FL 32223
904-262-6674
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
42. Veterinarian
Dr. Bob Van Duys
121 N. 52nd Ave.
Hollywood, FL 33021
305-987-5595
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
43. Veterinarian
Dr. Allison Rogers
3343 Debussy Rd.
Jacksonville, FL 32211
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
44. Calusa Crossings Animal Hospital
Dr. Allen Riggs
11266 SW 137 Ave.
Miami, FL 33186
305-386-6869
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
45. Palm Gardens Animal Clinic
Dr. Jack Harrison
4313 N. Lake Blvd.
Palm Beach Gardens, FL 33410
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
46. Central Florida Veterinary Lab
Mr. Ed Reed
6406 SW 170 St.
Archer, FL 32618
904-495-3105
Clients: Private Farms, Private Aquarium Stores,
Public Aquariums, Referral Lab for Vet. Practitioners.
Additional services: Hematology, Serum chemistry.
Fees are not available.
47. Veterinarian
Dr. Victoria Clyde
131 23rd Ave. N
St. Petersburg, FL 33704
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
48. Veterinarian
Dr. Denise Petty
P.O. Box 61
Odessa, FL
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
49. Veterinarian
Dr. Harold Albers
1401 4th St., N
St. Petersburg, FL 33704-4409
813-822-8301 Fax: 813-821-4952
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums, Petfish.
Fees are not available.
50. Florida Dept. of Agriculture & Consumer Services
Division of Plant Industries
Mr. Richard Goskalla (Dir.)
P.O. Box 147100
Gainesville, FL 32614-7100
904-372-3505 Fax: 904-374-6801
Clients: Private Farms, Private Aquarium Stores, Public
Aquariums.
All plant producers pay an annual registration fee.

51. Bar Diag Lab, Division Animal Ind, FDACS
Dr. H. L. Rubin
P.O. Box 420460
Kissimme, FL 34742
407-846-5200 Fax: 407-846-5204

52. Dr. J.C. Joyce
University of Florida
Program Center for Aquatic Plants
7922 NW 71st St.
Gainesville, FL 32606-0300
904-392-9613

GEORGIA

53. Fish Health Center
USFWS, Warm Springs NF
Mr. Howard Jackson
Route 1, Box 536
Warm Springs, GA 31830
404-655-2289
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public aquariums,
Tribal Fisheries.
No Fees.

54. University of Georgia
Dr. George Lewis
Cooperative Extension Service
Athens, GA 30602
404-5442-1924 Fax: 404-542-3872
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public
Aquariums.
No Fees

55. University of Georgia
College of Veterinary Medicine
Dr. Louis Newman
Tifton, GA 31793
912-386-3340
Clients: Provide service for veterinarians.
Additional services: Necropsy.
\$10 charge per lot of fish examined.

56. Veterinarian
Dr. Richard Green
1262 Atlanta Rd.
Marietta, GA 30060
404-952-3611
Clients: Private Aquarium Stores, Public Aquariums,
Ornamental Fish Industry.
Fees are not available

57. University of Georgia
Mr. David Anderson
College of Veterinary Medicine
Athens, GA 30602
404-542-3461

HAWAII

58. Aquaculture Development Program
Dr. James Brock, D.V.M.
335 Merchant St., Room 348
Honolulu, HI 96813
808-587-0030 Fax: 808-587-0033
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums,
Pacific Island Nations.
No Fees.

59. Dept. of Microbiology
University of Hauni
Dr. Philip Loh
2538 The Mall, Snyder 319
Honolulu, HI 96822
808-956-8055 Fax: 808-956-5339
Clients: Dr. Loh's program provides basic research in
the area of virology.
No fees.

60. The Oceanic Institute
Dr. Brad LeaMaster
Makapuu Point
P.O. Box 25280
Honolulu, HI 96825
808-259-7951 Fax: 808-259-5971
Clients: University Research, Private and
Government Research.
No Fees

61. The Oceanic Institute
Marine Shrimp Program
Ms. Pat Nevin
Makapuu Point
P.O. Box 25280
Honolulu, HI 96825
808-259-7951 Fax: 808-259-5971
Clients: The Oceanic Inst. shrimp projects.
No fees.

62. Waipahu-Leeward Veterinary Clinic
Dr. Darren Hisaraga
94-801 Farrington Hwy., Suite 3
Waipahu, HI 96797
808-671-4095
Clients: Private Aquariums, In-home pet fish.
Fees

63. The Waikiki Aquarium
Mr. Gerald Crow
2777 Kalakaua Ave.
Honolulu, HI 96815
808-927-9741 Fax: 808-923-1771
Clients: Waikiki Aquarium, occasionally private
aquarists.
Additional services: Diagnosis and treatment for fish
and invertebrates.
No fee.

64. Veterinary Diagnostic Lab
Dept. of Agriculture
Dr. Tom Sawa, Dr., Crane Hane
99762 Moanalua Rd.
Aiea, HI 96701
808-487-5351 Fax: 808-487-5984

IDAHO

65. Idaho Dept. of Fish & Game
Mr. Kent Hauck
Eagle Fish Health Lab
1800 Trout Rd.
Eagle, ID 83616
208-939-2413 Fax: 208-939-2415
P.O. Box 25280
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums.
No Fees.

66. Clear Springs Trout Co.
Dr. Randy Macmillan
P.O. Box 712
Buhl, ID 83316
208-543-8217
Clients: Clear springs trout.
Fees not available.

67. Rangen Aquaculture Research
Mr. Blake Grant
Rt. 1, Box 264
Hagerman, ID 83332
208-837-6191 Fax: 208-837-4565
Clients: Private Farms, State Hatcheries
Fees.

68. U.S. Fish & Wildlife Service
Dworshak Nat'l Fish Health Center
Mr. Joe Lientz
P.O. Box 18
Ahsahka, ID 83520
208-476-4591
Clients: Not available.

69. Idaho Bureau of Animal Health
Mr. Greg Nelson
P.O. Box 7249
Boise, ID 83707
208-334-3256

70. Idaho Animal Health Lab
Ms. Kendall Eyre, DVM
2230 Old Penitentiary Rd.
Boise, ID 83707
208-334-3111

71. Dr. Lincoln
University of Idaho
1020 E. Homedale Rd.
Caldwell, ID
454-8657

72. Dr. G.W. Klontz
University of Idaho Aquaculture Program
Moscow, ID 83843
208-885-5830 Fax: 208-885-5968

ILLINOIS

73. Illinois Dept. of Conservation - Fisheries Division
Mr. Rodney Horner
RR 4, Box 54
Manito, IL 61546
309-968-7531 Fax: 309-968-6007
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public
Aquariums, Wild Kill.
No Fees.

74. Laboratories of Diagnostic Medicine
Dr. Howard Gelberg and Dr. Laura Hungerford
University of Illinois
College of Veterinary Medicine
2001 S. Lincoln
Urbana, IL 61801
217-333-1620 Fax: 217-333-4628
Clients: Private Farms, University Research, Private
Aquarium Stores, Public Aquariums.
Fees.

75. Animal Disease Laboratory
Illinois Dept. of Agriculture
Mr. Dave Reynolds
9723 Shattuc Rd.
Centralia, IL 62801-5858
618-537-6701 Fax: 618-532-1195
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public
Aquariums.
Fees.

76. ILEPA, Division of Water Pollution Control
Mr. Bill Busch
2200 Churchill
P.O. Box 19276
Springfield, IL 62794-9276
217-782-3362
Clients: Public officials or citizens inquiry on fish kills.
No fees.

77. So. Illinois University at Carbondale
Mr. Dan Selock
Fisheries Research Lab
Southern Illinois University
Carbondale, IL 62901
618-453-6025 Fax: 618-536-7761
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
Additional services: Water quality in general.
No fees.

INDIANA

78. Purdue University ADDL
Mr. Randy White
West Lafayette, IN 47907
317-494-7456
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public
Aquariums.
Nominal service fee.

79. Purdue University ADDL
Mr. Leon Tharker, Dept. Head
West Lafayette, IN 47907
317-494-7460

80. Purdue University
Mr. Hugh Lewis, Dean
School of Veterinary Medicine
West Lafayette, IN 47907
317-494-7608

IOWA

81. Iowa State University
Dr. Baugh Seaton
Veterinary Diagnostic Laboratory
Iowa State University
Ames, IA 50011
515-294-1950 Fax: 515-294-3564
Clients: Private Farms, University Research, State
Hatcheries.
Fees.

82. Iowa Dept. of Natural Resources
Mr. Andy Moore & Mr. Mike Mason
Rathbun State Hatchery
Route 2
Moravia, IA 52571
515-647-2406
Clients: Private Aquafarms.
No fees.

83. Reinhart & Stamy
Norway, IA
515-227-7577

84. Iowa State University
Dean Richard Ross
College of Veterinary Medicine
Iowa State University
Ames, IA 50011
515-294-1250
Clients: Not available.

85. Iowa State University
Dr. Joe Morris
ISU Extension Fishery Specialist
Dept. of Animal Ecology
124 Science II
Ames, IA 50011

86. General Bacteriology Section
National Veterinary Services Lab
Ames, IA 5001
Clients: Aquaculture development program thru Hawaii
Dept. of Agriculture.

KENTUCKY

87. Kentucky State University
Cooperative Extension Program
Aquaculture Research Center
Dr. Bob Durborow
Frankfurt, KY
502-227-6581
Clients: Private Aquafarms; fees not available.

LOUISIANA

88. LSU School of Veterinary Medicine
Dr. Ron Thune
LSU Veterinary School
Baton Rouge, LA 70803
504-386-3308
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores, Public Aquariums.
Fees.

89. LSU School of Veterinary Medicine
Mr. William L. Jenkins
Baton Rouge, LA 70803
504-346-3151

MAINE

90. Maine Dept. of Inland Fisheries & Wildlife
Mr. David Locke Mr. David Tillinghast
State House Station #41
Augusta, ME 04333
207-289-5261
Clients: State Hatcheries.
Fees are not available.
91. Northeast Laboratory
Ms. Deborah Bouchard
P.O. Box 788
Waterville, ME 04901
207-873-7711 Fax: 207-873-7022
Clients: Private farms.
Fees.
92. Connors Aquaculture, Inc.
Hugh Mitchell, D.V.M.
P.O. Box 263, Estes Head
Eastport, ME 04631
207-853-6081 Fax: 207-853-6056
Clients: Private Farms.
Fees are not available.
93. Unity College
Dr. Jim Chacko
Unity, ME 04988
207-948-3131-
Clients: Private farms.
Fees.
94. Mr. Roger Dexter
East Orland, ME 04472
207-469-2061 (summer) 813-343-5889 (winter)
95. Northeast Laboratory
Mr. William Colby, President
P.O. Box 788
Waterville, ME 04901
207-873-7711 Fax: 207-873-7022

MARYLAND

96. Dept. of Natural Resources
Dr. Eric May, Dr. Frank Wills, Mr. Austin Farley,
Mr. Fred Kern
Oxford Cooperative Lab
Oxford, MD
401-226-5193
Clients: Private Farms, University Research, State
Hatcheries.
No fees
97. MD Dept. of Agric./University of Maryland
Dr. Frank Hetrick, Dr. Ana Baya
Animal Health Laboratory
8077 Greenmeade Drive
College Park, MD 20740
301-935-6074 Fax: 301-314-7713
Clients: Private Farms, State Hatcheries, Public
Aquariums.
Fees.
98. Maryland Dept. of Agriculture
Dr. Henry Virts, State Veterinarian
50 Harry Truman Pkwy.
Annapolis, MD 21401
410-841-5810 Fax: 410-841-5487
99. University of Maryland
Dr. Sashi Mohanty
VA-MD Regional College of Veterinary Medicine
College Park, MD 20742
301-935-6083 Fax: 301-935-6079

MASSACHUSETTS

100. Battelle Ocean Science Facility
Mr. Bob Hillman
Duxbury, MA
Clients: Private Farms, University Research.
Fees

MICHIGAN

101. Fish Health Laboratory
Mr. John Hnath
Michigan Dept. of Natural Resources
Wolf Lake State Fish Hatchery
34270 C.R. 652
Mattawan, MI 49071
616-668-2132
Clients: State Hatcheries
Fees are not available

102. Animal Health Diagnostic Lab
Dr. Willie Reed, DVM, Ph.D.
Michigan State University
College of Veterinary Medicine
P.O. Box 30076
Lansing, MI 48909
517-353-0635 Fax: 517-353-5096
Clients Private farms.
Fees are not available

102a. Michigan State University
College of Veterinary Medicine
Lansing, MI 48909

MINNESOTA

103. Dept. of Natural Resources
Mr. Joe Marcino
500 Lafayette Rd.
St. Paul, MN 55155-3999
612-296-3043
Clients: Private Farms, University Research, State
Hatcheries.
Fees

104. University of Minnesota
Mr. Robert Dunlop
Veterinary Medical School
455 Veterinary Teaching Hospital
1352 Boyd Ave.
St. Paul, MN 55108
612-624-9227

MISSOURI

105. Missouri Dept. of Conservation
Mr. V. Charles Suppes, Fish Pathologist
Blind Pony Fish Disease Diagnostic Lab
Sweet Springs, MO 65351
816-335-4531
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
No fees.

106. Missouri Dpt. Of Conservation
Mr. Gary W. Camenisch, Fish Pathologist
Fish Disease Diagnostic Lab
2630 N. Mayfair
Springfield, MO 65803
417-895-6880
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
No fees.

107. Missouri Dept. of Conservation
Ms. Mahalia C. Boyd, Fisheries Biologist
Fish Disease Diagnostic Lab
2630 N. Mayfair
Springfield, MO 65803
417-895-6880
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
No fees.

108. University of Missouri - Columbia
Mr. Robert Pierce
1-30 Agriculture Building
Columbia, MO 65211
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
No fees.

109. Aqua Science Research Group
1100 Gentry St.
N. Kansas City, MO 64116
816-842-5936
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
No fees.

110. Missouri Dept. of Agriculture Laboratories
(Jefferson City, Cameron & Springfield)
Dr. John Hennessey, State Veterinarian
P.O. Box 630
Jefferson City, MO 65102
314-751-3377

111. University of Missouri College of Veterinary Medicine
Mr. David Hardin
University of Missouri
W234 Veterinary Medicine
Columbia, MO 65211
314-882-7848 Fax: 314-882-2950

MONTANA

112. U.S. Fish & Wildlife Service
Mr. Charlie Smith
Fish Culture Development Center
4050 Bridge Canyon Rd.
Bozeman, MT 59715
406-587-9265
Clients: State Hatcheries
No fees

NEBRASKA

113. University of Nebraska
Dr. Jack Schmetz
University of Nebraska, Dept. of Veterinary Science
120 VBS (0905)
Lincoln, NE
402-472-2952

NEW JERSEY

114. Hasskin Shellfish Research Lab
Dr. Susan Ford
Box B-8
Port Norris, NJ 08349
609-785-0074 Fax: 609-785-1544
Clients: (Shellfish only) Private Farms, University Research, State Hatcheries, Public Aquariums.
Fees vary.
115. New Jersey Division of Fish, Game & Wildlife
Mr. Edmund Washuta
Pequest Trout Hatchery
RR1, Box 389
Oxford, NJ 07863
908-637-4173 Fax: 908-637-6753
Clients: Private Farms, State Hatcheries.
No fees.
- 115a. Aquarius Associates
Mr. Walt Canzonier
P.O. Box 662
Port Norris, NJ 08349
908-223-5229 or 609-785-0075
Clients: Private Farms, University Research, Public Aquariums.
No fees.

NEW YORK

116. NYS Dept. of Environmental Conservation
Dr. John Schachte
Fish Disease Control Unit
8314 Fish Hatchery Rd.
Rome, NY 13940
315-337-0910 Fax: 315-337-0988
Clients: Private Farms, University Research, Public Aquariums.
No fees.
117. NYS Veterinary Diagnostic Lab
NYS College of Veterinary Medicine
Cornell University
Ithaca, NY 14850

118. New York College of Veterinary Medicine
Dr. Paul Bowser
Cornell University
Dept. of Avian & Aquatic Animal Medicine
Ithaca, NY 14850
607-253-3365 Fax: 607-253-3369

NORTH CAROLINA

119. North Carolina State University/Mountain Horticulture Crops
Research and Extension Center
Dr. Jeff Hinshaw
2016 Fanning Bride Rd.
Fletcher, NC 287832
704-684-3562 Fax: 704-684-8715
Clients: Private Farms, State Hatcheries,
Fees.
120. North Carolina State University/College of Veterinary Medicine
Dr. Ed Noga or Dr. Michael Stoskopt
Dept. Companion Animal & Special Species Medicine
4700 Hillsborough St.
Raleigh, NC 27501
919-829-4230 Fax: 919-829-4336
Clients: Private Farms, University Research, State Hatcheries, Private Aquarium Stores.
Fees.
121. North Carolina Dept. of Agriculture
Mr. John K. Atwell, D.V.M.
Rollins Animal Disease Diagnostic Lab
P.O. Box 12223
Raleigh, NC 27605
919-733-3986 Fax: 919-733-0454
Clients: Private Farms, University Research, State Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology
122. North Carolina Dept. of Agriculture
Mr. W. Robert Gaines, D.V.M.
Animal Disease Diagnostic Lab
P.O. Box 38, Paradise Rd.
Edenton, NC 27932
919-482-3146
Clients: Private Farms, University Research, State Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology

123.North Carolina Dept. of Agriculture
Mr. William R. Rapp, D.V. M.
Western Animal Disease Diagnostic Lab
P.O. Box 279, Airport Rd.
Arden, NC 28704
704-684-8188 Fax: 704-684-3574
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology

124.North Carolina Dept. of Agriculture
Ms. Loren Buchanan, D.V.M.
Northwestern Animal Disease Diagnostic Lab
P.O. Box 70, N. Bridge St.
Elkin, NC 28621
919-526-2499 Fax: 919-526-3014
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology

125.North Carolina Dept. of Agriculture
Ms. Joanna Quinn, D.V.M.
Hoyle C. Giffin Animal Disease Diagnostic Lab
P.O. Box 2183, Quarry Rd.
Monroe, NC 28110
704-289-6448 Fax: 704-283-9660
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology

126.North Carolina Dept. of Agriculture
Mr. Hugh M. Powell, D.V.M.
Rose Hill Animal Disease Diagnostic Lab
P.O. Box 37, Rendering Plant Rd.
Rose Hill, NC 28458
919-289-2635 Fax: 919-289-2070
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology

127.North Carolina Dept. of Agriculture
Mr. William Wilson, D.V.M.
Poultry Disease Diagnostic Lab
P.O. Box 476, Rockingham St.
Robbins, NC 27325
919-948-2241
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology

128.North Carolina Dept. of Agriculture
Mr. Darrell D. Rector, Jr. D.V.M.
Poultry Disease Diagnostic Lab
130 Post Road Agriculture Building
Shelby, NC 28150
704-480-5438
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
Fees: \$20/accession for Necropsy
\$10/accession for Histology

NORTH DAKOTA

129.University of North Dakota
Dr. Harry Holloway
Box 8328 University Station
Grand Forks, ND 58202
701-777-2621 Fax: 701-777-2623
Clients: University Research
No fees

130. North Dakota Veterinarian Diagnostic Lab
Dr. Herbert Smith
North Dakota State University
Fargo, ND 58105
701-237-8306 Fax: 701-237-7514

OHIO

131.Ohio Dept. of Agriculture
8995 East Main St.
Reynoldsburg, OH 43068

132.The Ohio State University
Dean Ron Wright
Columbus, OH 43224
614-292-5661

OREGON

133.Oregon State University
Dr. Robert Olson
Hatfield Marine Science Center
Newport, OR 97365
503-867-0251 Fax: 503-867-0138
Clients: Private Farms, University Research, State
Hatcheries, Public Aquariums.
Fees.

PENNSYLVANIA

134. Pennsylvania Fish & Boat Commission
Mr. Kenneth Stark
1225 Shiloh Rd.
State College, PA 16801
814-355-4837 Fax: 814-355-8264
Clients: Private Farms, State Hatcheries.
Fees.

135. Pennsylvania State University
Animal Diagnostic Lab
Dr. Art Hattel
University Park, PA 16802
814-863-0837 Fax: 814-865-3907

136. Pennsylvania Dept. of Agriculture
Dr. Max VanBuskirk
2301 N. Cameron St.
Harrisburg, PA 17110
717-783-5301

- 136a. University of Pennsylvania
School of Veterinary Medicine
Philadelphia, PA 19104

- 136b. Pennsylvania State University
Director, College of Veterinary Med/Science
University Park, PA 16802

137. University of Pennsylvania
Mr. Edwin Andrews, Dean
School of Veterinary Medicine
3800 Spruce St.
Philadelphia, PA 19104
215-898-8841 or 814-863-0837

138. U.S. Dept. of Interior (Finfish)
Fish & Wildlife Service
Mr. John Thoesen, Director
Fish Health Unit
Lamar, PA 16848
717-726-6611

SOUTH CAROLINA

139. Clemson University
Dr. T.E. Schwedler
Agriculture, Fisheries & Wildlife Dept.
608 Lehotsky Hall
Clemson, SC 29634
803-656-2810
Clients: Private Farms, University Researchers, State
Hatcheries.
Fees.

140. Clemson University Livestock-Poultry Health Division
Dr. Jones Bryan
P.O. Box 10206
Columbia, SC 29224-2406
803-788-2260 Fax: 803-788-8058

SOUTH DAKOTA

141. South Dakota Dept. of Game, Fish & Parks
Mr. Rick Cordes, Hatchery Manager, Fish Health
Specialist
RR 1, Box 205
McNenny SFH
Spearfish, SD 577833-8905
605-642-6160 Fax: 605-642-3099
142. South Dakota Dept. of Game, Fish & Parks
Mr. Jerry Broughton
Blue Dog Lake State Fish Hatchery
RR 1, Box 22A
Qaubay, SD 57273-9775
605-947-4657
Clients: Private Farms, University Researchers, State
Hatcheries, Public Aquariums.
No fees.

143. South Dakota Dept. of Agriculture
D. J. Thorpe, State Veterinarian
411 So. Forth St.
Pierre, SD
605-773-3321 Fax: 605-773-5459

144. South Dakota State University
Dr. John Thompson
Animal Research & Diagnostic Lab
College Station
Brookings, SD
688-5171

TENNESSEE

145. University of Tennessee Agricultural Extension Service
Dr. Thomas K. Hill
Box 1071
Dept. of Forestry, Wildlife & Fisheries
Knoxville, TN 37901
615-974-7230
Clients: Private Farms, University Research.
No fees.

146. Tennessee Dept. of Agriculture
Diagnostic Lab
Dr. John Ragan
Ellingham Agriculture Center
Nashville, TN 37204
615-360-0120 Fax: 615-360-0194

147. University of Tennessee
College of Veterinary Medicine
P.O. Box 1071
Knoxville, TN 37901
615-974-7262

TEXAS

148. Texas A&M Extension Fish Disease Diagnostic Lab (EFDDL)
Dr. S.K. Johnson
Dept. of Wildlife & Fisheries Sciences
Texas A&M University
Nagle Hall
College Station, TX 77843-2258
409-845-7471 Fax: 409-845-7103
Clients: Private Farms, University Research, State Hatcheries, Private Aquarium Stores, Public Aquariums.
Fees vary.

149. Texas Veterinary Medical Diagnostic Lab (TVMDL)
Dr. Konrad Eugster
Sipple Rd.
College Station, TX 77843
409-845-3431

150. Dr. John Shaddock
Texas A&M University
School of Veterinary Medicine
College Station, TX 77843
409-845-5053

150a. Dr. Rolland Lramore (private practice)
2903 Pueblo
College Station, Tx 77843

VIRGINIA

151. Birginia-Maryland Regional College of Veterinary Medicine
Virginia Tech
Dr. Stephen Smith
Dept. of Pathobiology, VMR-CVM
Blacksburg, VA 24061
703-231-7666 Fax: 703-231-7367
Clients: Private Farms, University Research, State Hatcheries, Private Aquarium Stores.
Fees.

152. Virginia Dept. of Agriculture & Consumer Services
Dr. Bruce Akey, Chief
Bureau of Lab Services
1100 Bank St., Room 607
Richmond, VA 23219
804-786-9202 Fax: 804-371-2380
Clients: Private Farms, State Hatcheries, Private Aquarium Stores, Public Aquariums.
Fees.

153. Virginia Dept. of Game and Inland Fisheries
Mr. Gary Martel
P.O. Box 11104
Richmond, VA 23230
804-367-1292 Fax: 804-367-2628
Clients: Private Farms, State Hatcheries, Public Aquariums, Private Ponds.
No fees.

154. Virginia State Water Control Board
Ms. Jean Gregory
4900 Cox Rd.
Glen Allen, VA 23060
804-527-5093 Fax: 804-527-5267
Clients: Wild stock fish kills only.
Fees are not available.

155. Wytheville Regional Lab
Dr. Robert Duncan
P.O. Box 738
Cassell Rd.
Wytheville, VA 24382
703-228-5501

156. Dr. James Sims
Lynchburg Regional Lab
4832 Tyreeanna Rd.
Lynchburg, VA 24504
804-947-6731

157. Harrisonburg Regional Lab
Dr. Janice George
116 Reservoir St.
Harrisonburg, VA 228091
703-434-3897

158. Dr. Joseph Garvin
Warrenton Regional Lab
234 W. Shirley Ave.
Warrenton, VA 22186
703-347-3131

159. Richmond Central Lab
Dr. M. Neil Allison, Pathology, Dr. George Onet,
Microbiology
Consolidated Lab Building, Room 162
1 North 14th St.
Richmond, VA 23219
786-2446

160. Ivor Regional Lab
Dr. Jerry Dawson, Mr. Ron Kirkland
P.O. Box 290
Highway 460 West
Ivor, VA 23866
804-859-6221

WASHINGTON

161. Troutlodge
Mr. Randy McLeary
MacMillan, WA
206-863-0446
Clients: Own customers.
No fees.

162. Battelle Marine Sciences Lab
Dr. Ralph Eston
439 W. Sequim Bay Rd.
Sequim, WA 98382
206-683-4151 Fax: 206-681-3699
Clients: Private Farms.
Fees

163. University of Washington
School of Fisheries
Dr. Marshal Landolt, Dir.
School of Fisheries, WH-10
Seattle, WA 98195
Clients: Private Farms, University Researchers, Private
Aquarium Stores.
Fees.

164. U.S. Fish & Wildlife Service
Olympia Fish Health Center
3704 Griffin Lane, SE, Suite 101
Olympia, WA 98501
206-753-9046 Fax: 206-753-9403
Clients: Federal & Tribal Hatcheries.
Fees are not available.

165. National Fishery Research Center-Seattle
Dr. James Winton
U.S. Fish & Wildlife Service Building 204
Sand Point Naval Air Station
Seattle, WA 98115
206-526-6282 Fax: 206-526-6654
Clients: Federal and Tribal Hatcheries.
Fees are not available.

166. Lower Columbia River Fish Health Center
Mr. Eric Pelton
U.S. Fish & Wildlife Service
Milepost 61, 75R, State Road 14
Underwood, WA 98651
509-493-3156 Fax: 509-493-2980
Clients: Federal and Tribal Hatcheries.
Fees are not available.

167. National Marine Fisheries (NMFS)
U.S. Dept. of Commerce NOAA/NMFS/CZES
Mr. Lee W. Harrell, D.V.M.
P.O. Box 130
Manchester, WA 98353
206-842-7181 Fax: 206-842-8364
Clients: Private Farms, University Research, State
Hatcheries, Federal Research.
No fees.

168. Washington State Dept. of Fisheries
Mr. Kevin Amos
115 General Admin. Bldg.
Olympia, WA 98504
206-586-2825 Fax: 206-664-0661
Clients: Sportfishing enhancements, schools, Etc.
Fees, but not to public entities.

169. Washington Dept. of Wildlife
Mr. John Kerwin
600 Capital Way N.
Olympia, WA 98501-1091
206-753-2902 Fax: 206-586-0248
Clients: State Hatcheries.
No fees.

170. Northwest Indian Fisheries Commission
Mr. Bruce Stewart
6730 Martin Way East
Olympia, WA 98506
206-438-1180 Fax: 206-753-8659
Clients: Private Farms, Tribal hatcheries.
Fees for private farmers.

171. Washington State University
Dr. Borje K. Gustafsson, Dean
College of Veterinary Medicine
Pullman, WA 99164
509-335-9515- Fax: 509-335-6094

WEST VIRGINIA

172. The Freshwater Institute
Dr. Alicia Noble, DVM
P.O. Box 1746
Sheperdstown, WV 25443
304-876-2815 Fax: 304-876-0739
Clients: University Research
No fees.
173. Ms. Aggy Vanderpool Extension Aquaculturist
WVU Extension Service
P.O. Box 130, 201 Henry Ave.
Elkins, WV 26241-0130
304-636-2455
Clients: Private farms.
No fees.
174. West Virginia Dept. of Agriculture
Diagnostics Lab
Dr. Lewis Thomas, DVM
State Capitol Building
Charleston, WV 25305
304-348-3418
175. West Virginia University
Dr. Paul Lewis
Dept. of Animal and Vet Sciences
Agricultural Sciences Building
Percival Hall
Morgantown, WV 26506
304-293-2231
176. U.S. Fish & Wildlife Services
Leetown National Fisheries Center
Kearneysville, WV 25430
Clients: Private farms, Univ. Research, State Hatcheries.
No Fees
177. U.S. Fish & Wildlife Service
Dr. Roger Herman, Lab Director
National Fish Health Research Lab
P.O. Box 700
Kearneysville, WV 25430
304-725-8461
Clients: Private farms, Univ. Research, State Hatcheries.
No Fees

WISCONSIN

178. Dept. of Natural Resources
Ms. Sue Marcquenski
200 Webster
Madison, WI 53562
Clients: Private Farms, State Hatcheries.
Fees.

179. WDATCP

- Dr. Bob Exlenfeldt
6101 Mineral Pint Rd.
Madison, WI
608-266-2465 Fax: 608-267-0636
180. University of Wisconsin
Dean B. Easterday
2015 Linden Drive
Madison, WI 53706
608-263-6716
181. U.S. Fish & Wildlife Service
Mr. Rick Nelson
Fish Disease Control Center
2630 Fanta Reed Rd.
LaCrosse, WI 54603
608-783-6451
Clients: State Hatcheries.
Fees
182. Fish Disease Control Center
P.O. Box 1595
LaCrosse, WI 54602
608-783-6451
Clients: Private Farms, University Research, State Hatcheries, Private Aquarium Stores, Public Aquariums.
No Fees.
- ## WYOMING
183. Wyoming Game & Fish Dept.
Mr. Douglas L. Mitchum
Wyoming Game & Fish Lab
P.O. Box 3312, University Station
Laramie, WY 82071
307-766-5618 Fax: 307-766-5360
Clients: Private Farms, University research, State Hatcheries, Private Aquarium Stores, Public Aquariums, State Wild & Federal Populations.
No Fees.
184. Wyoming State Veterinary Lab
Dept. of Veterinary Sciences
Ms. Lynn Woodard, DVM, Ph.D., Director
1174 Snowy Range Rd.
Laramie, WY 82070
307-742-6638
Clients: Private Farms, University Research, State Hatcheries, Private Aquarium Stores, Public Aquariums, Anyone.
Fees are a maximum of \$35.

DISTRICT OF COLUMBIA

185.Smithsonian Institute

Dr. John Harshbarger
Registry of Tumors in Lower Animals
National Museum of Natural History
Room W216A
Washington, DC 20560
202-357-2647
Clients: Private Farms, University Research, State
Hatcheries.
No fees.

PUERTO RICO

186.Caribbean Aquatic Animal Health Project

Dr. Lucy Bunkley-Williams
P.O. Box 908
Lajas, PR 00667
809-899-2048 Fax: 809-889-5500
Clients: Private Farms, University Research, State
Hatcheries, Private Aquarium Stores.
No fees.

GUAM

187.Dept. of Agriculture Gouvernement of Guam Agana, Guam

CANADA

188.Atlantic Veterinary College

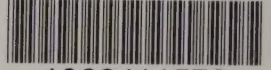
Dr. David Groman
University of Prince Edward Island
550 University Ave.
Charlottetown, Prince Edward Island, Canada, C1A 4P3
902-566-0863 Fax: 902-566-0723
Clients: Private Farms.
Fees.

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